THE IMPACT OF FOREIGN DIRECT INVESTMENT ON CHINA'S COMPETITIVENESS

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I certify that this thesis is the true and accurate version of the thesis approved by the examiners.

Signed [redacted] ..... (Director of Studies) Date 11/8/2003

To

MY PARENTS

Father: 郑朝荣

Mother: 王德花

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ABSTRACT

In the past few decades, the role of FDI in developed economies has been extensively studied. The impact of FDI inflows on host developing countries has also attracted increasing attention in recent years. However, the research on the effects of FDI on national competitiveness of host developing countries has been relatively neglected. This thesis aims to fill the gap in the literature by providing systematic and rigorous research, which focuses on whether and how FDI inflows have affected China's competitiveness from both macroeconomic and microeconomic perspectives.

Using several panel data sets at provincial and industrial levels, the empirical analysis has been conducted on four research issues. First, the regional locational determinants of FDI in China are investigated. Second, the impact of FDI on China's economic growth is tested. Third, the impact of FDI on China's export performance is analysed. Finally, the impact of FDI on China's industrial productivity is estimated.

There are a number of important findings from this study. First, FDI is the most important driving force for the remarkable economic growth of China at both national and regional levels. Second, FDI has a positive influence on total firms' exports but relatively less effect on indigenous firms' exports. Third, FDI plays a positive role in improving labour productivity in China's automotive industry. In summary, FDI does enhance China's competitiveness.

Based on the findings from the empirical analysis, this thesis draws a number of policy implications. Firstly, to further enhance China's competitiveness, the Chinese government should keep its FDI policy coherent and stable and optimise the investment environment in order to support FDI inflows. Secondly, the government should endeavour to improve foreign investment structure while upgrading investment quality to help China's industrial restructuring, technological upgrading, and state-owned enterprises' reform. Thirdly, the linkages between the foreign and domestic sectors need to be improved. Fourthly, the government should encourage foreign investors to invest in the central and western regions to help China's western development strategy, which in turn serves China's economic regional restructuring, eventually enhancing China's competitiveness.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Foreign direct investment (FDI) has become an important driving force for economic globalisation. Especially since the 1980s, FDI has grown at a much faster pace than either world trade or world production. Multinational corporations (MNCs), the chief conduit for FDI (Caves, 1971), play a central role in economic growth, technology development and dissemination, capital formation, and trade in both home and host countries.

The market-oriented economic reforms and 'opening up' policy pursued by the Chinese government since 1978 have resulted in high economic growth and a dramatic transformation in the economic structure. China's economy, the World Bank (1995) argued, is the third largest one in the world behind the US and Japan after PPP adjustment. It is affecting the world in every aspect: patterns of trade, foreign investment, international migration, environmental quality, even military activity (Jefferson, 1997).

As a result of the 'opening up' policy, FDI has gradually 'blossomed' in China. Since 1993, China has been the largest recipient of FDI among the developing countries (UNCTAD, 1996)[1]. By the end of 1999 (the last year of the empirical

[1] This statement implicitly assumes that Hong Kong is a developed country or region. Some authors, however, prefer to classify it as a developing country or region.

studies period in this thesis), the total number of projects of FDI in China reached 341,062, with a total utilised amount of US$ 305.92 billion. This is equivalent to 10 percent of direct investment worldwide and about 30 percent of the total investment amount for all the developing countries (OECD, 2000). In 2002, the amount of actually used FDI in China reached US$ 52.7 billion, making China the largest recipient of FDI in the world, even ahead of the US. It is therefore important to assess the impact of FDI inflows on China.

In the past few decades, the role of FDI in developed economies has been extensively studied. The impact of FDI inflows on host developing countries has also attracted considerable and increasing attention in recent years. However, the research on the effects of FDI on national competitiveness of host developing countries has been relatively neglected. Only occasional note has been taken of this issue in the theoretical literature (for instance, Caves, 1974), and only a few empirical studies in developing countries (for instance, Bonelli, 1999; Wei and Liu, 2001). In some ways, the extent to which host developing countries benefit from FDI depends on the improved competitive conditions associated with FDI presence.

With increasing inflows of FDI into China, the issue of the effect of FDI on China's competitiveness is becoming increasingly important. First, competitiveness has become a key concern to economists, analysts and policy-makers due to the critical need to reduce present current account imbalances via augmented competitive exports and efficient import substitution. Second, FDI inflows may also represent a substantial complement to domestic savings in financing investment. Increased investment rates for further economic growth eventually improve social conditions.

This thesis aims to provide systematic and rigorous research analysing if and how FDI has influenced China's competitiveness in terms of China's economic growth and export performance from the macroeconomic perspectives and industrial productivity from the microeconomic perspective. The research issues studied in this thesis are summarised as below:

Research Issue 1 The regional locational determinants of FDI in China. The geographical distribution of cumulative FDI in China is significantly characterised by its high concentration in the eastern coastal region, which is relatively more developed. By contrast, only a small amount of FDI flows into the central and western regions, which are considerably less developed and poor. The most important task of the Tenth Five-year Plan (2001-05) of China is to develop the western region, which is in great need of capital investment. To attract more FDI inflows into the western region, it is important to identify the regional locational determinants of FDI in China.

Research Issue 2 The impact of FDI on China's economic growth. Since the Chinese government conducted economic reforms and 'opening up' policy in 1978, China has achieved remarkable economic growth rates, ranking China among the fastest growing economies in the world. To continue the rapid economic growth in China, it is essential to investigate whether and how FDI inflows affect China's economic growth at both national and regional levels.

Research Issue 3 The impact of FDI on China's export performance. Similarly, China has also achieved a remarkable expansion in export performance since the economic reforms. However, most MNCs in developing countries are export-oriented.

They take advantage of the local cheaper factors to reduce their production costs to further improve their international competitiveness. This fact raises interesting issues to detect whether and how FDI inflows affect China's total exports including FDI firms' exports and China's indigenous firms' exports.

Research Issue 4 The impact of FDI on China's automotive industrial productivity. High rates of productivity growth are often sought as a way of strengthening competitiveness and it is argued that the host country's competitiveness will be enhanced if FDI firms actually promote the host country's industrial productivity. The automotive industry is one of the six main industries in China. Also the industry attracts a significant amount of FDI inflows. It is necessary to analyse whether and how FDI inflows affect the labour productivity of China's automotive industry.

This chapter provides a brief preview of the thesis. This section presented an introduction as to why such a research topic is selected for study and what research issues will be investigated in this thesis. The rest of the chapter is organised as follows. Section 1.2 discusses the background of the study. Section 1.3 introduces the data used in the thesis and the data sources. Section 1.4 discusses the methodologies employed in the thesis and the last section summarises the structure of the thesis.

1.2 Background of the Study

The impact of FDI inflows on host developing countries has attracted considerable attention in recent years. The theoretical and empirical literature reveals controversy. As Caves (1996, p. 214) pointed out:

"MNEs have gone through a cycle in their encounters with host-country governments. They have met hostility and resentment in all countries that host substantial foreign investment, but nowhere more than in the LDCs from World War II through the 1970s. They were blamed for the national economy's manifest shortcomings, not to mention the historical sins of colonial domination, as well as genuine clashes of economic interest. With the waning of socialism and the coming of the LDCs' debt crisis, much of the acrimony vanished, but the issues that it raised continue to dominate the research literature."

At the theoretical level, FDI could both positively and negatively affect a host developing country's economy. On the one hand, FDI may supply capital to supplement domestic savings and finance balance of payments deficits. FDI may supply necessary and more advanced technology, including technical services, process and product technology, managerial skills, adaptation of existing technology, and provision of training. FDI may transfer marketing skills and connections and promote manufacturing exports in the host country. FDI may create linkage effects, forward and backward, and promote local industrial development through local sourcing. FDI may increase the host country's international contacts through the global network of MNCs.

On the other hand, FDI may also transfer inappropriate technology and products, creating technology dependence, discouraging indigenous technological development. If MNCs largely engage in intra-firm trade or focus only on the local market, FDI may be anti-trade. Also if MNCs' sourcing is mainly from parent firms or subsidiaries in other countries, FDI may thus prevent the setting up of related industries locally.

Similarly, the controversy is reflected at the empirical level. The available evidence is far from being clear-cut. Some empirical evidence shows positive effects while others show negative effects. This will be further discussed in the following relevant chapters.

In fact, the actual economic impact of FDI in a particular case depends on the type of FDI and MNCs established, the development strategy of the host developing country in general and with reference to FDI in particular, and the economic environment and conditions of the host country (Chen, 1990).

China is chosen as the study object for a number of reasons. First, China is the largest transition developing country in the world. As mentioned above, China as one of the dominant players in the global economy is affecting the world in every aspect. The empirical results and policy implications obtained from this study are not only significant to China but also to other developing and transition economies for adjusting their policy regimes to FDI.

Second, China has been the largest recipient of FDI in developing countries for many years (see Table 1.1). China has made significant progress in attracting FDI. By

the end of 2002, a cumulative total of 423,719 foreign-invested enterprises had been approved with contracted FDI totalling US$ 827.81 billion and the actually utilised FDI totalling US$ 446.23 billion. According to the World Investment Report (UNCTAD, 2002), China has been the largest recipient of FDI among all developing countries and regions for the past nine consecutive years.

Third, FDI flows into a wide range of sectors (see Table 1.2) and affects China's economy in every perspective. FDI has continued to play an important role in China's economy. FDI branches take up 23 percent in the total added value of the Chinese industry, 18 percent of taxation and 48 percent of total exportation (People's Daily Online[2], 18th Sep 2002).

[2] See the website at http://english.peopledaily.com.cn/

Table 1.1 FDI inflows in the world 1990-2001

US$ billion

	1990	1992	1994	1995	1996	1997	1998	1999	2000	2001
World Total	203	168	254	315	359	464	644	865	1300	735
Developed Economies	176	102	146	208	211	273	460	636	1000	503
Developing Economies	34	50	101	106	130	173	166	208	238	205
China	2	3	11	34	38	41	45	40	41	47
Brazil	1	1	3	5	10	18	29	31	34	22
Mexico	3	5	12	10	9	13	10	12	13	25
Hong Kong	2	2	4	3	3	6	2	25	64	23
Singapore	5	6	9	7	8	10	7	7	6	8
Malaysia	2	4	4	4	5	5	4	4	5	5

Sources: UNCTAD, *World Investment Report,* various issues

Table 1.2 Distribution of contracted FDI in China by sector

US$ billion

	1979-86	1987-91	1992-94	1979-98
Total	19.18	33.18	252.21	572.50
Agriculture, forestry, animal husbandry & fishing	0.57	0.80	2.84	9.36
Industry	7.60	25.66	127.87	338.20
Construction	0.31	0.56	8.11	17.76
Transport, warehousing, post & telecommunications	0.28	0.29	5.06	13.86
Wholesale & retailing, catering	1.42	0.44	9.97	20.76
Real estate	5.99	4.48	85.71	142.75
Health care, sports & social welfare	0.07	0.15	2.85	4.55
Education, culture, arts, broadcasting, film & TV	0.08	0.13	1.16	1.97
Scientific research & technical services	0.01	0.06	0.92	1.74
Others	2.86	0.61	7.72	21.56

Source: Wei and Liu (2001)

Finally, FDI in China comes from more than 150 countries in the world, both developed and developing countries. More than 400 of the world's top 500 companies have launched operations in China and over 200 of them have set up research and development (R&D) organisations (People's Daily Online, 9th Sep 2002).

As said by Guangsheng Shi, the Minister of Foreign Trade and Economic Cooperation of China, increasing FDI and gradual promotion of external investment are important channels for China to further enhance its comprehensive competitiveness.

1.3 Data

The data used in this thesis are at provincial and industrial level from different sources published by Chinese authorities.

1. ***China Statistical Yearbook*** edited by the State Statistical Bureau of PRC

2. ***China Foreign Economic Statistical Yearbook*** compiled by the Department of Trade and External Economic Relations Statistics, National Bureau of Statistics, China

3. ***Almanac of China's Foreign Economic Relations and Trade*** edited by the Editorial Board of the Almanac of China's Foreign Economic Relations and Trade

4. ***International Financial Statistics Yearbook*** complied by IMF

5. ***China Automotive Industry Yearbook*** edited by China Automobile Technology Research Centre and China Automotive Industry Association

It should be noted that the data published by developing countries are often of poor quality (Kholdy, 1995). Similarly, the quality of data collected by Chinese officials may not be as good as those in developed countries (Zhao and Zhu, 1998). However, studies of Chinese data collection concluded that: 'official statistical reporting in China is by and large honest' (Chow, 1986). Chinese economic statistics are also currently coming under increasing scrutiny (BBC News, 27th May 2002). These data sources also have been widely used by other researchers in studying Chinese economic issues.

1.4 Methodology

Several panel data sets, which pooled time-series and cross-section data, are employed in this thesis. Two econometric software packages E-Views and STATA are used to conduct the econometric estimations. Previous empirical studies on economic perspective with FDI presence suggested that the use of panel data may be the most appropriate way for a systematic and efficient analysis of such a topic (Wei and Liu, 2001; Shan, et al. 1999; Dees, 1998).

Hsiao (1985, 1986) and Baltagi (1995) argue that panel data sets for economic research possess several major advantages over conventional cross-sectional or time-series data sets. First, panel data suggests individual heterogeneity. Time series and cross-section studies not controlling for this heterogeneity run the risk of obtaining biased results. Second, panel data usually give us a large number of data points, increasing the degrees of freedom and variability, reducing the collinearity among explanatory variables hence improving the efficiency of econometric estimates. Third, panel data are better able to study the dynamics of adjustment. Fourth, and more important, longitudinal data allow us to analyse a number of important economic questions that cannot be addressed using cross-sectional or time-series data sets. Finally, panel data allow us to construct and test more complicated behavioral models than purely cross-sectional or time-series data. The use of panel data also provides a means of resolving or reducing the magnitude of a key econometric problem (estimation bias) that often arises in empirical studies because of omitted variables that are correlated with explanatory variables.

However, it does not mean the use of panel data is not problematic. Panel data does have its limitations, such as design and data collection problems, distortions of measurement errors, selectivity problems, and short time-series dimension.

There are three statistical models used to estimate the panel data sets: pooled ordinary least squares (POLS), fixed effects (FES) or least squared dummy variable (LSDV), and random effects (RES) or error components (EC). These models differ mainly in their assumptions, which are further discussed in Chapter 5.

These three models have their own advantages and disadvantages. The POLS model is simple to estimate, also POLS estimators are the best liner unbiased estimators if individual effects do not exist. However, this assumption is very strong and unlikely in most cases. The FES model allows variation in these effects, but including dummy variables as extra regressors makes it less efficient than the RES model because of the loss of degrees of freedom. The RES model relegates the unobservable individual-specific effects into the error term and assumes that they are correlated with the regressors. Violation of this assumption may cause the RES model to produce biased and inconsistent estimates.

According to Judge et al. (1985), Hsiao (1986), Baltagi (1995), and Greene (2000), three tests are usually applied to identify the best statistical model among the three models. They are the Likelihood ratio (LR) test for the FES model against the POLS model; the Lagrange multiplier (LM) test for the RES model against the POLS model; the Hausman specification (HS) test for the FES model against the RES model. Large values of the LR, LM, and RE statistic argue in favour of the FES

model against the POLS model, the RE model against the POLS model and the FES model against the RES model, respectively.

1.5 Structure of the Thesis

This thesis investigates the effects of MNCs on the competitive dynamics of China, as a host developing country (see Figure 1.1). As figure 1.1 shows the thesis considers both macroeconomic impacts on economic growth and exports and microeconomic impacts on productivity. Inflows of FDI not only transfer capital but also transfer foreign technology and managerial skills. Thus, FDI could improve host country productivity. The raised productivity could increase the host country's competitiveness in international markets, reflected by enhanced export performance, which further speeds up economic growth. The strengthened economy increases the probability of further investment that in turn may attract more FDI inflows. The whole process forms a 'virtuous cycle'. On the other hand, a 'vicious cycle' is also a possibility. FDI may also hinder domestic development through a variety of business practices that may adversely affect indigenous firms.

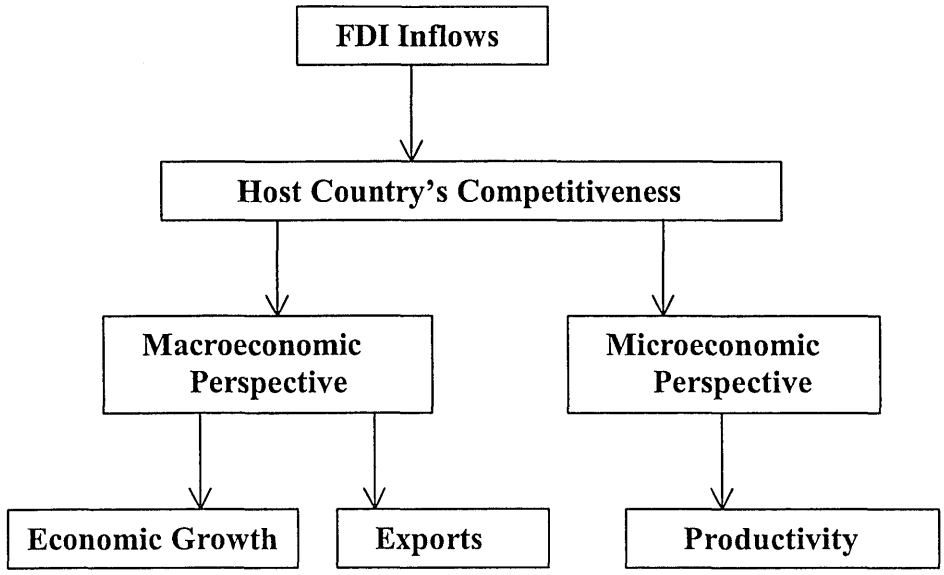


Figure 1.1 FDI and competitiveness of host country

As mentioned above, four research issues will be studied and this thesis will contain eight chapters accordingly. Following this introductory chapter, Chapter 2 will present the theoretical framework and review the relevant literature in the area. This will provide the theoretical bases for the whole thesis.

Chapter 3 describes the background of FDI in China regarding the evolution of the Chinese government policies, the development process, the main forms, the external sources, and the determinants of FDI inflows in China. This will provide the general information for the four empirical studies in the following chapters.

Chapter 4 explores the regional location determinants of FDI distribution in China at national and regional levels by using a panel data approach. Also the reasons causing the uneven spatial pattern of FDI in China will be discussed.

Chapter 5 investigates the impact of FDI on China's economic growth performance at both national and regional levels by using panel data. This is an important macroeconomic dimension of China's competitiveness.

Chapter 6 assesses the impact of FDI on China's export performance, which divided into total national exports including FDI firms' exports and indigenous exports. This is another important macroeconomic dimension of China's competitiveness.

Chapter 7 studies the impact of FDI on productivity of China's automotive industry by using a small panel data set, which is an important determinant of China's competitiveness.

Chapter 8 presents overall conclusions and policy implications. In addition, the contributions and limitations of the study and further research topics are also discussed.

Finally, the list of abbreviation variables will be shown in the Appendix.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

As pointed out by Braunerhjelm and Svensson (1996), the theoretical foundation of FDI is rather fragmented, drawing from different fields of economics. Several theories have been put forward to explain FDI. Hymer (1960) views the MNC as an oligopolist and FDI is considered to be the outcome of broad corporate strategies and investment decisions of profit-maximising firms facing worldwide competition. Dunning (1977) and Rugman (1981) use transaction costs to explain MNCs' internationalisation, putting emphasis on the intangible assets firms have acquired. Bhagwati and Srinavasan (1983) and Grossman and Helpman (1991) use the international trade theory to explain the allocative aspects of FDI.

The sustained growth of FDI over the past three decades has attracted a great deal of attention. While there has been much research on FDI, most of it has been from the perspective of the investing home country and MNCs. It examines issues such as why (Dunning, 1988; Buckley & Clegg, 1991), when (Buckley & Casson, 1981), where (Dunning, 1998), and how (Gatignon & Anderson, 1988; Pan & Tse, 1996) FDI enters the host economy. By contrast, relatively fewer studies have attempted systematically and comprehensively to look at the other side of the coin, from the perspective of the investment receiving host economy, in particular host developing

economy, although the impact of FDI inflows on host developing countries has attracted increasing attention in recent years.

This chapter will present the conceptual and theoretical framework and review the relevant literature, which provides the theoretical base for the following chapters. The rest of the chapter is organised as follows. Section 2.2 introduces the conceptual framework of competitiveness. Section 2.3 discusses the theoretical framework. Section 2.4 reviews the literature regarding the impact of FDI on host developing countries and the last section offers the summary.

2.2 Conceptual Framework of Competitiveness

Many policy makers express serious concerns about national competitiveness (Lall, 2001). "Competitiveness" is a multidimensional concept, often employed by economists and public officials. As described by Fagerberg (1996), competitiveness is one of the most popular buzz-words of our time. Although it is widely used, there is still a fierce debate in the theoretical field. Krugman (1994) has talked about the concern for competitiveness of a country as 'a dangerous obsession', while Dunning (1995) argues that "competitiveness is about benchmarking economic performance" and "competitiveness does matter".

Why does this issue attract so much attention? First, it can be applied at several levels, e.g. whole economies, sectors, and firms[3]. Second, it is a relative concept. The

[3] In this thesis, we will focus on its application to a country.

interest concerned is not a country's absolute performance, but how good it is relative to other countries. Third, when applied to a country, it has a double meaning, since it relates both to the economic well-being of the citizens as well as to the nation's trade performance. There are many definitions around, most of which reflect this 'double meaning' in one way or another.

As pointed out by Porter (1998, pp.XII), "there was no accepted definition of competitiveness. To firms, competitiveness meant the ability to compete in world markets with a global strategy. To many members of Congress, competitiveness meant that the nation had a positive balance of trade. To some economists, competitiveness meant a low unit cost of labour adjusted for exchange rates".

OECD (1992, p.237) argues that competitiveness is "the degree to which, under free and fair market conditions, a country can produce goods and services which meet the test of foreign competition while simultaneously maintaining and expanding the real income of its people".

Competitiveness can at the most straightforward level be defined as "the ability of a country or company to, proportionally, generate more wealth than its competitors in world markets" (WEF & IMD, 1995), or as a nation's capacity to achieve economic growth (WEF, 1996). The OECD (1995) describes competitiveness policy as "supporting the ability of companies, industries, regions or supra-national regions to generate and sustain high factor income and factor employment levels".

It includes several factors in a broad definition about national competitiveness. An economy can be said to be competitive if its productivity increases at a rate similar to or higher than that of its major trading partners with a comparable level of development, if it maintains external equilibrium in the context of an open free-market economy, and if it realises a high level of employment (EC, 1997).

Dunning (1988) pointed out that: "At any rate, competitiveness is usually defined in terms either of the firm's performance as a whole in relation to what it perceives to be its main competitors, or its ability to produce and sell a particular range of products or capture specific markets. Measures include profitability, growth of asset value, market share or change in market share, export performance, productivity, and so on".

Competitiveness also depends on variables that can themselves be varied, such as government policies and the institutional framework. Summarised, it is an intrinsically dynamic and multidimensional concept. It is also very clear that no single factor has great explanatory power on its own to represent national competitiveness. The analysis of national competitiveness should contain a number of indicators of past performance, such as economic growth, productivity and export success, alongside a number of indicators of 'potential', such as education standards or R&D capabilities. All of these indicators are combined to contribute to the potential dynamic national competitiveness.

2.3 FDI in Dynamic Competitiveness Process

Conventional trade theories include the absolute advantage theory, the comparative advantage theory, and Heckscher-Ohlin factor endowment theory. Adam Smith introduced the doctrine of absolute advantage, which is built on the economies of scale realisable from an extended market through exports, while David Ricardo constructed the doctrine of comparative advantage, which is enhanced by specialisation-induced allocative efficiency. The Heckscher-Ohlin theory was founded on the uneven distribution of factors of production among countries. All of these trade theories assume international immobility of factors. Conventional trade theories thus capture international exchanges of commodities that exploit and profit from any differentials in price and availability of commodities between different locations, the differentials being determined by productivity and factor endowments. Moreover, all of these theories treat firms as if they were non-existent because of the usual assumption of perfect competition. Hence no firm-specific advantage is permissible.

However, Hymer (1976) explicitly pointed out the existence of firm-specific assets. He argues that FDI draws on the role of firms as creators and exploiters of intangible corporate assets. It is therefore no longer logical to assume perfect competition and FDI is viewed to take place only in imperfect markets.

In his eclectic paradigm, Dunning (1988) specifies three essential conditions for international production. First, the firm must possess some ownership-specific advantages; second, to exploit those advantages, internalisation (local production under equity ownership) is more beneficial to the firm than arm's-length transactions

(for example, exporting and licensing); and finally overseas locational factors are more favourable than domestic ones.

Vernon (1966), in his product-life-cycle theory, argues that new products are initially introduced in a high-income country, but will eventually spread to the world, first to other advanced countries, later to the developing countries as the products mature and become technologically standardised. It is a dynamic model of changing comparative advantage and technology transfers. However, this model constructed from the perspective of an innovating advanced country, but it could not explain how the transfer of standardised production affects the economic development and structure of the developing host countries.

Porter (1998) distinguished four basic stages of national competitive development in his theory of "stages of competitive development": the factor-driven stage; the investment-driven stage; the innovation-driven stage; and the wealth-driven stage. The first three stages are associated with the development of competitive advantage and are characterised by specific types of factor endowment.

Porter argues that each country begins on the path of evolutionary development at a stage where simple labour and natural resources are used to produce labour-intensive or raw material-intensive goods. At the second stage, the competitive advantage pattern is shifted to capital-intensive commodities. At the third innovation-driven stage, the country is already endowed with highly skilled human capital and is pursuing an active R&D policy and competitive advantage shifts to highly innovative and technologically modern products.

Porter points out that most developing countries are at the first stage of development and are building competitive advantage in labour-intensive and natural resource-intensive goods. But some of these countries are already at the second stage, where investments in capital-intensive activities play the crucial role.

Following Porter's theory, Ozawa (1992) formulated a comprehensive theory describing linkages between economic development and the creation of competitive advantage in international trade as well as the impact of FDI on these processes (Wysokinska, 1998). In his study, Ozawa emphasises that a particular stage of competitive development is associated with a particular pattern of export competitiveness. Economic growth and transformation are therefore accompanied by the changing patterns of dynamic comparative advantage.

By introducing the additional variable of FDI into Porter's theory, Ozawa points out that FDI affects and reflects the position of a national economy. The pattern of FDI, both inward and outward, changes in conjunction with the stages of structural transformations in the economy. The first factor-driven stage attracts resource-seeking or labour-seeking inward FDI. The transition from the labour-driven to the investment-driven stage generates outward investments towards lower-wage countries in labour-intensive manufacturing and attracts inward FDI in capital and intermediate goods industries. The transition from the investment-driven to the innovation-driven stage brings inward FDI in technology-intensive industries and outward FDI in intermediate goods industries.

Based on Kojima's theory (1975) that FDI plays an active role in the utilisation or international transfers of competitive advantage, depending on whether FDI substitutes or complements trade, Ozawa argues that FDI has a significant effect on economic development through an increase in trade. An increase in trade flows occurs as a result of improved competitive advantage, which is in turn influenced by FDI leading to changes in the pattern of this advantage. Acceleration of economic growth is conditioned on the adoption of an export-led strategy of development and an outward orientation for the economy, associated with a favourable environment for FDI inflows.

It is clear that outward and export orientation regime attracts pro-trade FDI, inward orientation and import substitute regime attracts anti-trade FDI. It is widely recognised as it has been empirically proved that the former is more effective than the latter in achieving a faster economic growth and structural upgrading in the developing countries. Many developing countries, especially the Asian newly industrialising countries and the emerging newly industrialising countries such as Indonesia, Malaysia and Thailand are successfully developing by opening up their economies under outward-oriented policies. This type of regime creates a climate favourable for the transfer by FDI, which in turn becomes the main driving force behind the industrial upgrade and economic growth of those rapidly developing countries.

2.4 MNCs' Characteristics and Host Country's Competitiveness

As mentioned above, FDI contributes to the national dynamic competitive advantage of the developing countries, in which the outward-oriented regime is adopted. Dunning (1988) argued that MNCs affect economic activity, the pattern of that activity and its outcome. In short, MNCs affect the competitiveness of countries. Porter (1998) pointed out that a skilled workforce and innovative ability of a country are two main resources influencing national competitiveness. In their study, O'Donnell and Blumentritt (1999) claim that MNCs with certain characteristics are greater providers of the resources that are important in building and maintaining the host country's competitiveness. The advanced technology and managerial skills provided by foreign subsidiaries are essential in enhancing the skills of a nation's workforce and innovative capability of the host country. The certain characteristics include foreign subsidiary strategic role within the corporation, the level of technology employed in the processes, the training provided for the employees, and the level of international interdependence.

Foreign subsidiary roles may differ in several respects such as the degree to which they are actively involved in the formulation and implementation of corporate strategy and the degree to which they are creators and users of knowledge within the MNC (Birkinshaw and Morrison, 1995; Jarillo and Martinez, 1990). Some subsidiaries may be given the authority to make strategic and operating decisions autonomously while others may be implementers of parent headquarters' developed strategic decisions (Ghoshal and Bartlett, 1990; Taggart, 1997). Therefore, based on their different

strategic roles, some subsidiaries may have the capability to contribute to the international competitiveness of their host countries more than others.

A subsidiary with a global mandate role has worldwide responsibility for a complete set of value activities associated with a particular product or product line. The corporate expertise for the product or product line resides in the subsidiary, by which R&D, production, and marketing activities are managed on a global basis. In other words, the subsidiary can make subsidiary-level strategic decision by itself while developing the products for the global market. Such a subsidiary will enhance the skills and abilities of its employees in R&D, production, marketing, and support activities. Thus, the subsidiary is likely associated with increased technical and managerial expertise in its host country, which in turn contribute to the national competitiveness of the host country.

The level of technology used by the foreign subsidiary is another important factor in the degree to which the subsidiary can contribute to the host nation's competitiveness. Mowery and Oxley (1995) note that host countries can reap the benefits of inward technology transfer and spillovers to enhance their innovative capability and skills of the workforce especially from inward foreign investment in high-tech industries such as electronics, pharmaceuticals, and biotechnology. They also argue that inward investment in high-technology industries has played an important role in the post-war economic development of Japan, Taiwan, and South Korea.

High-tech, knowledge-intensive industries have a high tacit knowledge component. A foreign subsidiary can be an important channel for the transfer of such tacit, high-tech knowledge through the demonstration and application of advanced product, process technologies, and innovative managerial techniques.

Knowledge and skills can be transferred from the foreign subsidiaries to the host country through both formal and informal training. Training provides a mechanism for transferring product and process technology and for building the technical and managerial skills of the subsidiary's local workforce. In their study, Kogut and Zander (1992) classify "knowledge" into two categories: information and know-how, which are transmitted through different types of training. Information refers to knowledge that can be transmitted through facts, manuals, and symbols. It can be transferred more efficiently through formal training programs. Know-how refers to accumulated skill or expertise and it is facilitated through less formal means.

The fundamental purpose of a training program is the dissemination of information. The transmission of technical and managerial information from parent headquarters to the foreign subsidiary through formal training can increase the subsidiary's level of innovation capability as well as the skills of its local employees. Thus foreign subsidiaries have the ability to enhance the national competitiveness of their host countries through their contribution to the innovation capability and skills of their employees.

In contrast, the transfer of know-how in terms of skills and expertise from parent headquarters to the local employees occur through informal training. The process of

transferring tacit knowledge is less direct and more cumulative because know-how must be learned and acquired over time (Nonaka, 1994). Skills and expertise can be difficult to pass on to others because of their tacit nature. Training programs can facilitate the transfer of such tacit skills and expertise, particularly if hands-on training and interaction in small groups are adopted. Tacit knowledge is more easily communicated when relationships are built through small group interaction and group members built up common experiences. Both formal training programs and informal interactions among employees are important in the transfer of information and know-how from a foreign subsidiary to the workforce of host country.

Another characteristic of foreign subsidiaries that contribute to the host country's competitiveness is international interdependence, which refers to the degree of interaction among the foreign subsidiaries and parent headquarters of the MNC concerning to their activities and outcomes. The interaction will facilitate the transfer of capabilities and knowledge between the subsidiary and other organisation units within the corporation, particularly those highly interdependent with each other. International interdependence also implies that international subsidiaries of the MNC depend on each other to perform their functions and achieve their goals. To function effectively in such an interdependent network, each unit must have the capabilities to perform its role within the system. Therefore, the subsidiary is more likely to be a receiver as well as a supplier of intra-MNC flows of explicit and tacit knowledge if it experiences a greater degree of international interdependence.

As argued above, subsidiaries that possess high-tech knowledge and managerial skills will contribute more to the host country's innovative capability and the skills of

its workforce. Such a foreign subsidiary within an international MNC network can have greater access to the skills and knowledge of the other units of the international MNC network to perform its organisational function effectively, increasing its ability to contribute to its host country and eventually enhance the host country's competitiveness. Moreover, it is likely that the subsidiary characteristics discussed above might interact to have a combined and stronger effect on competitiveness of the host country (O'Donnell and Blumentritt, 1999).

2.5 The Impact of FDI on Host Developing Economies

After a drop in FDI flows to the developing world in the early part of the 1980s, the period since 1984 has witnessed a sustained rise. The distribution of FDI flows within the developing world has shown a shift over the 1980s. By the early part of the decade, Latin America, traditionally the largest recipient of FDI in the developing world, saw its share of FDI decrease as its debt problems multiplied. By contrast, the share in South and Southeast Asia increased. Also in China especially in the 1990s, the share has dramatically increased, and it is row the largest recipient in the developing world.

With FDI increasingly flowing into developing countries, the assessment of the costs and benefits of MNCs has, despite the methodological problems, attracted a large amount of analysis in recently years. The theoretical and empirical research on the relevant issues is increasing as well. However, the overall impact of MNCs is very difficult to assess because of the complexity of issues involved, the limited data

problem, and conceptual problems. As Caves (1996) pointed out the analysis of the development of local capabilities and a dynamic comparative advantage with FDI presence in developing countries is still in its infancy.

MNCs can have many types of linkages with indigenous firms. Lall (1978) pointed out that there are two broad sets of relationships involved, both of which are significant for understanding the effects of MNCs on host economies and to the formulation of policy. The direct relationships that MNCs set up with local suppliers or purchasers (backward and forward linkages) can constitute powerful mechanisms for stimulating economic and particularly industrial growth in developing countries.

The most important direct linkages are those established with local suppliers of parts, components and services. Such backward linkages may be regarded as of special significance because they generally involve greater interaction than normal market relations between anonymous buyers and sellers, for example, transfer of information, technology, skills, finance and so on. Such "quasi-vertical integration" is widespread in all intra-industry transactions, in developed as well as developing countries, and can be a valuable source of specialisation, diffusion, stability and subcontracting benefits.

Some empirical evidence (Lall, 1980; Lim and Pang, 1982; Reuber et al., 1973) suggests that MNCs can be quite active in setting up such linkages when host governments force the pace of indigenisation of inputs under import-substituting regimes. What the evidence also suggests, however, is that, in an unconstrained environment and weak local capabilities especially where export-oriented activities

are concerned, MNCs prefer to retain linkages overseas rather than undertake the extra cost of developing potential local suppliers (Hill, 1985). One interesting recent feature of linkages is the propensity of MNCs, especially from Japan, to induce their home-country suppliers to follow them in setting up affiliates overseas (UNIDO, 1990). Therefore, the benefit of local suppliers with MNCs' presence is unclear, because they may be displaced rather than being upgraded.

Apart from direct linkages, MNCs can have various indirect linkages with local firms. These indirect linkages may be important as much as direct linkages because they may affect local industrial structure, conduct, and performance. MNCs may change the nature and evolution of concentration of local industries; may affect the profitability and growth of indigenous firms; may vary financing, marketing, technological, and managerial practices of the sectors that they enter (Lall, 1978).

Beneficial linkages may include the spillover of skills and efficiency to local firms, partly from externalities created by MNCs, partly from increasing competitive pressures on local firms in product and factor markets. Evidence suggests that such benefits do exist, and can induce faster structural changes in industries with strong MNCs activity (Blomstrom, 1989). Harmful linkages may arise when the presence of MNCs inhibits entrepreneurial or technological development in local competitors, or induces them to adopt socially undesirable practices like distorting consumption patterns by powerful marketing. The economic division of labour between MNCs and local firms may become fixed and static and negative effects may overshadow positive spillovers (Buckley and Casson, 1989; Grossman, 1984).

Since FDI flows tend to be dominated by large oligopolistic MNCs entry, especially into the small markets of developing countries, FDI raises concerns about their effects on local markets structure and competition. The standard literature claims that FDI tends to reduce the level of concentration and therefore increase competition in host country industries (Caves, 1982). However, this view has been questioned by some development economists. They argue that most empirical studies on this issue refer to host developed countries and since they have a very different industrial structure from developing countries, FDI will have a different effect. According to Lall (1979) and Blomstrom (1986), FDI actually increases the level of concentration and decreases competition in the host developing countries.

Technology-related concerns have dominated the literature on MNCs, which are treated as the major source of modern technology to developing countries. As Das (1987) pointed out that MNCs transfer new technology from the parent headquarters to its overseas subsidiaries and the indigenous firms of the host country then learn the new technology from the subsidiaries. The diffusion may occur through direct and indirect linkages such as forward and backward linkages, social network, collaborative research, and personnel movement (Buckley and Casson, 1998).

Cantwell (1989) argues that MNCs may play a role in a "virtuous cycle" of increasing technological capability of indigenous firms. By a process of cumulative causation, countries can develop rapidly and are able to devote resources to encourage indigenous technological development. This will further spur inward investment increasing innovation activities and R&D, which in turn stimulate local rivals to make a higher rate of innovation and encourage agglomerative economies in technological

centres in host economies. Moreover, the virtuous cycle of technological development may be enhanced further if indigenous firms can assist MNCs in a partnership arrangement.

However, a "vicious cycle" is also possible in which MNCs may decrease the technological capability of indigenous firms especially in weaker sectors of the host country. For example, when FDI takes the form of assembly activities in the host countries or MNCs with weak local linkages that are far more likely to import components from their parent headquarters or other overseas subsidiaries, technology is an important barrier to hinder sourcing from indigenous firms (Turok, 1993).

The promotion of exports is a contribution that most developing countries expect from MNCs. Helleiner (1973) argues MNCs as "agents of dynamic comparative advantage", playing a major role in the future development of manufactured exports from the developing countries. He distinguishes these exports into four broad categories. First is local raw material processing. Locally produced raw materials can be subjected to further processing, and MNCs sometimes undertake this role either as an economic choice or in response to host-country inducements. Second is the conversion of import-substituting industries to exporting. Some developing countries have become heavy exporters of simple manufactured goods whose production processes are suitable to their factor endowments. MNCs' marketing networks and established brand names are important in such export activity. Third is new labour-intensive final product exports. Labour-intensive processes in manufacturing operations may be carried on in developing countries facilities that import unfinished goods and export them after additional processing. Evidence indicates that MNCs

play a significant role in these offshore processes. Fourth is labour-intensive processes and component specialisation within vertically integrated international industries. In some of the larger and more advanced developing countries, some import-competing manufacturing industries, both local firms and MNCs, have been transformed into successful exporters.

In overall terms, exports by MNCs have risen over time as a percentage of world trade, and often as a share of the host country's total exports (Blomstrom, 1990). There is no doubt that MNCs can make an important net contribution to export promotion when the host country has a very specific resource that can be complemented by elements provided by MNCs. For example, when the marketing of exports requires an established network of vertically integrated facilities across countries, or powerful brand names, or when production involves easily transferred proprietary inputs or knowledge. For countries with less dynamic indigenous firms, MNCs can act as agents of changing comparative advantage, where circumstances are conducive to a transfer and exploitation of their ownership advantages and cross-border coordination of activities. The dynamism of the process depends, however, on the ability of the host country to continuously upgrade its own input of skills, infrastructure and domestic suppliers, and such an ability can also be exploited by indigenous firms where these are promoted.

MNCs' effects on the economic growth rate of the developing country might seem to provide the ultimate relationship to be investigated (Caves, 1996). FDI affects economic growth in several ways. First, as mentioned above, it is argued that FDI has been a major channel for the access to advanced technologies by recipient countries

and hence plays a central role in the technological progress of those countries (Borensztein et al. 1998). Findlay (1978) argues that the host countries can benefit from the 'contagion effects' associated with the advanced technology, management practices and marketing skills used by foreign firms.

Second, outputs from FDI activities are often destined mainly to third-country markets outside the host and source countries. As inputs, FDI activities have used capital goods and other intermediate inputs supplied by host and other foreign countries. Thus, FDI is associated with both import and export trade in goods, and the host country can benefit from an investment-led export growth.

Third, FDI is an agent for the transformation of both the host and home economies (Lloyd 1996). MNCs have played a central role in developing the host countries' production capacities, which are often directed towards export-oriented activities. As a result, FDI contributes to the transformation of the industrial structure of the host economy and the commodity composition of its exports.

Finally, the presence of foreign firms in the economy with their superior endowments of technology and management skills will expose local firms to fierce competition. Foreign firms will progressively induce plant managers and government officials to adopt the rules of a market economy, through the diffusion of management and marketing skills and the adoption of legislation aimed at promoting greater reliance on the market (Chen et al. 1995). Local firms may also be under pressure to improve their performance and to invest in research and development (R&D). Thus, FDI enhances the marginal productivity of the capital stock in the host economies and

thereby promotes growth (Wang and Blomstrom 1992). In addition, Lahiri and Ono (1998) observed that higher efficiency of foreign firms may help lower prices and hence increase consumers' surplus. Furthermore, FDI raises employment by either creating new jobs directly or using local inputs, thus creating more jobs indirectly.

As mentioned above, in addition to theoretical studies, the empirical research on the relevant issues are increasing as well, especially regarding Asian Newly Industrialised Economies (NIEs). Korea, one of the NIEs, has achieved remarkable economic progress during the two decades of 1962-82, the real GNP growth per annum reached over 8%. At the same time, Korea's industrial structure has significantly changed, transforming Korea from a backward agriculture nation to a semi-industrial modern country. In his study, Koo (1985) examines the role FDI has played in bringing about the marked changes in Korea's economic structure. He finds that the pattern of FDI in Korea has been strongly influenced by Korean government policy and FDI firms' influence on industrial efficiency in Korea has been positive but marginal. In other words, FDI had played a very minor role in enhancing Korea's ability and Korea's industrialisation has been directed and controlled almost entirely by Korean nationals.

In fact, the effects of FDI depend on the environment, system, and policies (ESP) of the host countries as much as on the strategy and behaviour of foreign investors themselves. The absorptive capacity of Korea's labour force has been high due to the relatively high level of education and the good work ethic, and the economic system has not been excessively biased. Therefore, Korea's industrial policies and FDI policies have been important factors in determining the effects of FDI in Korea.

During 1962-73 when Korea's government pursued an export-oriented industrialisation strategy, the pattern of FDI in Korea first began in import-substituting industries and then gradually moved to export industries. The effects of FDI on allocative and industrial efficiency were positive. FDI in exporting industries contributed to allocative efficiency in Korea, while most FDI in import-substituting industries provided essential raw materials for exporting industries or for domestic consumption. However, during 1973-80 when the government adopted an ambitious import-substituting industrialisation strategy with heavy import protection, FDI in Korea moved back to import-substituting industries like chemicals and machinery. The positive effects of FDI may have been much less.

As pointed out by Koo, the changes in Korea's economic structure have been mainly determined by the Koreans themselves rather than FDI. FDI have had some influence in industries like electronics through their exporting activities, but their effects on both allocative and industrial efficiency appear to have been marginal in determining the overall pattern of industrial development in Korea.

By contrast, in his study, Schive (1988) focuses on the relationship between FDI and economic development in Taiwan. FDI in Taiwan has shown an increasing trend since 1960, 20% of FDI come from overseas Chinese, while 31%, 24%, and 13% come from the US, Japan, and Europe, respectively. Comparatively, non-Chinese investors have concentrated on the manufacturing sector, particular on electrical and electronics industry while overseas Chinese have focused on mature industries or the service sector.

During 1965-85, FDI was 1.37% to 4.32% of Taiwan's total capital formation. However, the contribution of FDI to the manufacturing was even higher, at 7.33% of its peak during 1969 and 1972. In general, FDI has not made a significant contribution to Taiwan's total capital formation except modestly in the manufacturing sector. However, FDI has played an active and important role in Taiwan's economic development, particularly in employment and export performance. During the period of 1974 to 1982, FDI contributed about 20% of Taiwan's total exports and generated 15% to 17% of total employment in manufacturing sector.

By studying MNCs' technology in relation to their market orientations, Schive (1988) found that export-oriented foreign firms used a much more labour-intensive technology than the domestic market-oriented foreign firms. Therefore, market orientation is a crucial factor in determining the "appropriate" technology used by foreign firms, and the orientation of foreign firms helped improve resource-allocation efficiency in Taiwan in the 1960s and 1970s.

In summary, FDI has been successful in promoting Taiwan's economic growth and development. Also Taiwan's experience provides several lessons as pointed out by Schive. First, a positive attitude and favourable policies toward FDI are probably the most important factor to attract and effectively utilise FDI. Second, as mentioned above, foreign firms' market orientation is the most important factor in determining the "appropriate" technology used.

2.6 Conclusions

This chapter has presented the conceptual and theoretical framework and also reviewed the relevant literature regarding the effects of FDI on the dynamic competitiveness of host developing countries. It provides the theoretical bases for the whole thesis.

Based on the introduction of the chapter, Section 2.2 provided the conceptual framework of competitiveness. Obviously, competitiveness is a dynamic and multidimensional concept. The analysis of national competitiveness should contain a number of indicators of past performance, such as economic growth, productivity and export performance, along with a number of indicators of 'potential', such as R&D and innovation capabilities. Among these, no single factor has great explanatory power on its own to represent national competitiveness, instead all of these are combined to contribute to the dynamic national competitiveness.

Section 2.3 analysed FDI in the dynamic competitiveness process by reviewing the evolution of the existing theories, from the conventional trade theories to Hymer's FDI theory, from Vernon's product-life-cycle theory and Dunning's eclectic paradigm to Porter's theory of "stages of competitive development". Following Porter's theory, Ozawa formulated a comprehensive theory describing linkages between economic development and the creation of competitive advantage in international trade as well as the impact of FDI on these processes.

Section 2.4 discussed the MNCs' characteristics, which provide the resources to build and maintain the host country's competitiveness. The certain characteristics include four aspects, foreign subsidiary strategic role within the MNC, the level of technology employed in the processes, the training provided for the employees, and the level of international interdependence. Each of them will contribute to, more likely, they may interact to create a stronger combined effect on competitiveness of the host country.

Section 2.5 focused on the impact of FDI on host developing economy. MNCs can have many kinds of relationships with indigenous firms. These relationships can be split into two categories, one is direct linkages such as backward and forward linkages, the another is indirect linkages, which affect local industrial structure, conduct, and performance. However, the effects of FDI on host countries depend on the environment, system, and policies (ESP) of the host countries themselves as much as on the strategy and behaviour of foreign investors.

In the case of Korea, Korea's government industrial policies and FDI policies have been important factors in determining the effects of FDI in Korea. In other words, the changes in Korea's economic structure have been mainly determined by Koreans themselves and FDI has been marginal in determining the overall pattern of industrial development. By contrast, FDI has played an active and important role in Taiwan's economic development, particular in employment and export performance. Behind these, the positive attitude and favourable policies toward FDI are probably the most important factor to attract and effectively utilise FDI.

CHAPTER 3

THE BACKGROUND OF FDI IN CHINA

3.1 Introduction

FDI was not allowed in China until the Chinese government conducted the economic reform and opening up policy. However, FDI in China since then has achieved a remarkable development. This chapter will present an overview of FDI in China by providing a detailed description of the FDI policies, FDI features and development in China, which offers the background information for the following chapters regarding the empirical studies.

The rest of the chapter is organised as follows. Section 3.2 describes the evolution of China's FDI policies and the three development phases of FDI in China. Section 3.3 discusses the main forms of FDI in China. Section 3.4 presents the external sources of FDI in China. Section 3.5 analyses the determinants of FDI inflows into China and the last section offers a summary.

3.2 The Evolution of Policies and the Development of FDI in China

Before China's economic reform, the Chinese economy was virtually closed to the western world and foreign investment because of the Maoist ideology of "self-sufficiency". Since China embarked on the market-oriented economic reforms and

opening-up policy in 1978, however, FDI has gradually "blossomed" in China (Tso, 1998). By the end of 1999, the total number of projects of FDI in China reached 341,062, with a total utilised amount of US$ 305.92 billion (see Table 3.1).

Comparing "Contracted" and "Actually used" values of FDI in the Table 3.1, we find a big gap between them in some years. As Liu et al. (1997) and Wei et al. (1999) argue, contracted FDI is normally realised over a period of several years in many cases. Also part of contracted FDI never materialises. Furthermore, the changed environment in terms of the political, economic and social conditions in both home and host countries could create a time lag between contracted and actually used FDI.

Table 3.1 FDI in China 1979 - 1999

US$ 100 million

Year	Number of projects	Contracted value	Actually used value
1979-83	1392	77.42	18.02
1984	1856	26.51	12.58
1985	3073	59.32	16.61
1986	1498	28.34	18.74
1987	2233	37.09	23.14
1988	5945	52.97	31.94
1989	5779	56.00	33.92
1990	7273	65.96	34.87
1991	12978	119.77	43.66
1992	48764	581.24	110.07
1993	83437	1114.36	275.15
1994	47549	826.80	337.67
1995	37011	912.82	375.21
1996	24556	732.77	417.25
1997	21001	510.04	452.57
1998	19799	521.02	454.63
1999	16918	412.23	403.19
Total	341062	6134.66	3059.22

Source: China State Statistical Bureau, *China Statistical Yearbook 2000*

According to Dees (1998), Wu (1999), and OECD (2000), the growth of FDI in China following changes in policy directions can be distinguished into three different phases (see Figure 3.1). The first phase, from 1979 to 1983, is a period of sluggish increase. In the second phase 1984 to 1991, the inflows of FDI show an increasing trend. Since 1992, in the third phase, large-scale FDI has rushed into China. From 1993, China became the largest recipient of FDI among the developing countries (UNCTAD, 1996).

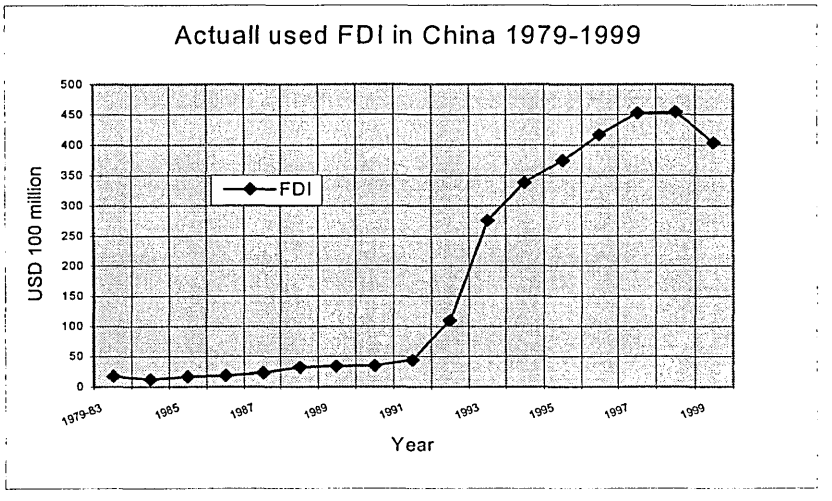
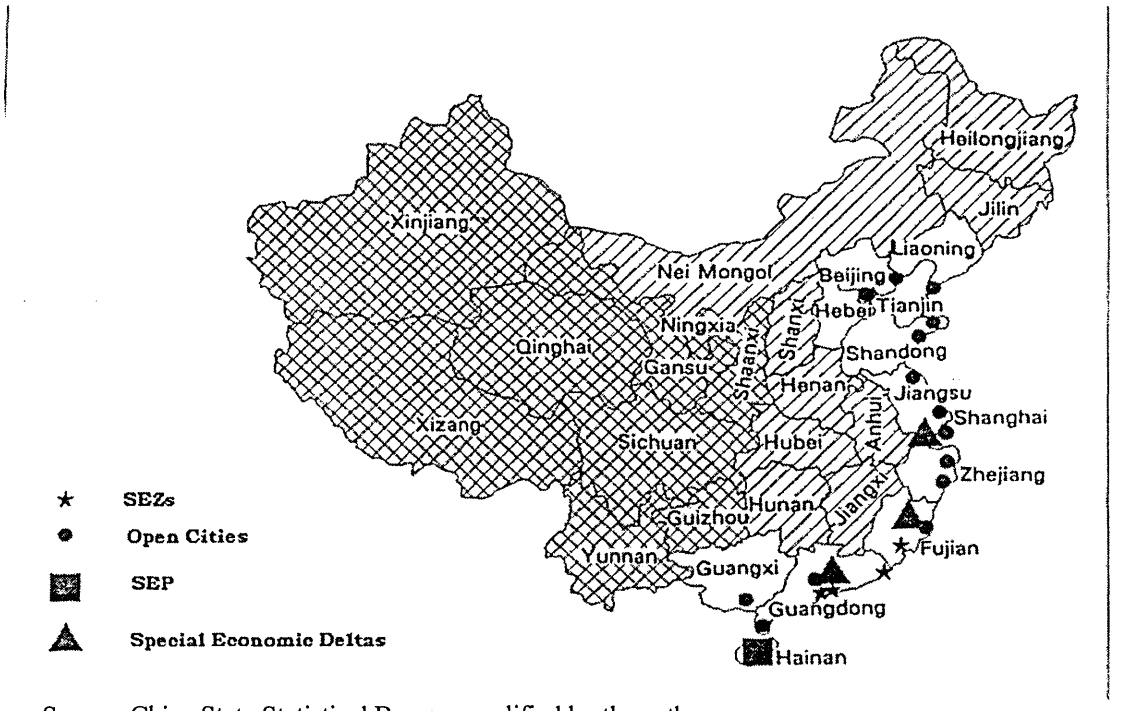


Figure 3.1 Actually used FDI in China 1979-1999

In 1978, Xiaoping Deng was emerging as post-Mao China's paramount leader. At the same time, the Third Plenum of the Chinese Communist Party's Eleventh Central Committee passed a resolution to reverse Mao's ideology of self-sufficiency and launched a market-oriented economic reform and opening-up policy. The prohibition of FDI in China, which had been in force since 1949 when the Chinese Communist Party came to power, was lifted. China started the economic transition from a closed and centrally planned socialist state-owned economic regime to an open market

economy. Under the new strategy, the Chinese government was keen to seek economic co-operation with the western capitalist world for accessing foreign technology, capital, and markets. The objectives were to develop a diversified industrial base, introduce and transfer new and advanced technology, stimulate economic growth, upgrade managerial and labour skills, and increase exports especially manufactured goods (Dees, 1998).

For this purpose, the Chinese government issued a series of laws and policies to attract foreign capital and technology. In July 1979, the Fifth National People's Congress launched the first "Law of the People's Republic of China on Joint ventures Using Chinese and Foreign Investment". In the same year, the Chinese government granted the authority to Guangdong and Fujian provinces to deal with foreign trade and investment. In 1980 four special economic zones (SEZs) were established in Shenzhen, Zhuhai, Xiamen, and Shantou in the two provinces in order to attract foreign investment inflows into these areas (see Figure 3.2). Special policies were adopted within the zones to give foreign-invested enterprises (FIEs) most favourable treatment in terms of tax concessions, access to credit and raw materials such as land use. For FIEs in SEZs, there is a two-year income tax holiday, followed by another three-year of low tax rate at 7.5%. After the initial five years, FIEs then pay a 15% tax rate. In comparison, for FIEs outside the SEZs, the tax rate is 33%, while 55% for the domestic state-owned firms.



Source: China State Statistical Bureau, modified by the author

Figure 3.2 SEZs, Open Cities, and Special Economic Deltas in China

It is obvious that China's foreign investment policies at the beginning had a very strong regional characteristic that was deliberately biased towards the Southeast coastal region. The intention was to take regional advantage to attract foreign capital from Hong Kong and Macao. Due to the lack of a well-defined legal framework and poor infrastructure, during the period of 1979 to 1983, only 1392 foreign investment projects were approved, the total value of contracted FDI was US$7.74 billion and only US$1.8 billion was actually received (see Table 3.2).

Table 3.2 Three phases of FDI in China 1979-1999

US$ 100 million

	Number of projects		Contracted value		Actually used value	
1979-83	1392	0.4%	77.42	1.2%	18.02	0.6%
1984-91	40635	11.9%	445.96	7.3%	215.46	7.0%
1992-99	299035	87.7%	5611.28	91.5%	2825.74	92.4%
Total	341062	100%	6134.66	100%	3059.22	100%

Source: China State Statistical Bureau, computed by the author

In 1984, 14 coastal cities including Shanghai, Tianjin, Dalian, and Guangzhou were selected to be the first group of "open cities" opening to foreign investment (see Figure 3.2). These open cities soon established their own "economic and technological development zones" in which FIEs could enjoy favourable treatment the same as that offered to FIEs in the SEZs except for the income tax of 24%, while FIEs in manufacture industry in these areas are taxed at a 15% rate concession. This resulted in a spread of FDI from the SEZs to the entire Pacific coastal regions.

In 1985, the Chinese government launched another urban reform program and expanded the regions open to foreign investment with three special economic deltas (see Figure 3.2) including the Pearl River delta, the Yangtze River delta, and the South Fujian delta which led to the first boom of FDI inflows into China. Only in 1985, 3073 foreign investment projects were approved and the total value of contracted foreign investment reached US$5.93 billion, the value of realised investment was US$1.66 billion (see Table 3.1).

In April 1986, the Chinese government issued the "Law on Foreign Enterprises" which formally grants legal rights to wholly foreign-owned enterprises in China. In October 1986, the Chinese government further issued the "Provision on Encouraging Foreign Investment", an administrative order to encourage foreign investment, permitting more freedom of independent operations for FIEs and granting more tax incentives for foreign investment. Local governments were also given more authority in reviewing the applications of foreign investment. It marked a new stage in FDI policy development.

In April 1988, the Chinese government passed the "Law on Co-operative Ventures". In the same year, Hainan province was incorporated as another SEZ (as SEP in Figure 3.2). Moreover the Chinese government further amended the joint venture laws that included a legal ban on expropriation, relaxed restrictions regarding expatriation of profits and dividends, and allowed foreign nationals to be the chairman of the board of directors in FIEs. FDI showed a steady trend of increase until the Tiananmen Incident in June 1989 that greatly impeded FDI in China. Nevertheless, the situation began to gradually change in late of 1990. To reverse the worsening investment climate, the Chinese government issued the Amendments to the Joint Venture Law in April 1990. In 1991, the Income Tax Law for Enterprises with Foreign Capital and Foreign Enterprises was passed. The FDI environment was further improved in China. During the second phase from 1984 to 1991, the total FDI projects reached to 40635 with total contracted value US$ 44.6 billion and actually used value US$ 21.55 billion (see Table 3.2).

In 1992, following Deng's historic tour of south China and his call for accelerating economic reform and growth, the Chinese government formally launched the new ideology of building a "socialist market economy with Chinese characteristics". Many outside investors, especially ethnic Chinese, perceived this as a sign for an impossible reversal of China's economic reforms. Many Asian investors became optimistic that the new policies would eventually transform China into a more open, market-based economy and the country could begin growing in the same way as its successful East Asian neighbours. Furthermore, in order to avoid economic sanctions imposed by the western world after the Tiananmen incident, the Chinese government launched a series of policies, which further liberalised its FDI regime in 1990 and 1991. The

Pudong New Area of Shanghai, the largest city and industrial centre of China, as a new development zone with its preferential policies even broader in scope than a SEZ opened up to foreign investment.

From this phase, the orientation of foreign investment policy has shifted from coastal region to inland areas. In the same year of 1992, the Chinese government further opened six port cities along the Yangtze River, 13 border cities and 18 capital cities of inland provinces as the "open cities", which could enjoy the same policy autonomy as the coastal open cities. The Chinese government also formally permitted the commercialisation of state-owned lands, eased regulations on domestic sales of products made by FIEs, and allowed foreign investment to enter service sectors such as transport, telecommunications, finance, retailing, and real estate. In addition, political stability in the aftermath of the Tiananmen incident also helped lower the political risks for foreign investments. By 1992 China had signed investment protection agreements with more than forty-seven countries which greatly enhanced the investment incentives of foreign investors. In 1993, actual used FDI further reached a historic peak of US$ 27.5 billion, more than double the amount in 1992 (see Table 3.1).

After that, the Chinese government has become more interested in the quality rather than the quantity of foreign investment from 1994. A wide range of policies have been planned and implemented. First, further relaxed foreign currency control and made the Chinese currency fully convertible as soon as practical and feasible. Second, phased out preferential policies for foreign investment in SEZs and Pudong by the end of the century. Third, slashed tariff and non-tariff barriers for the import

and export of a wide range of products. Fourth, further encouraged foreign investors to invest in the central and western regions. During the period from 1992 to 1999, total FDI projects reached up to 299035 with contracted value as US$ 561.1 billion and actually used value US$ 282.6 billion (see Table 3.2). At the same time, China's economy was also among the fastest-growing countries in the world.

3.3 The Main Forms of FDI in China

Since 1979, FDI in China has taken several different forms which are split into five categories by Chinese statistical authorities including equity joint ventures (EJVs), wholly foreign-owned enterprises (WFOEs), contractual joint ventures (CJVs) or co-operative enterprises, joint explorations (JEs) or co-operative development, and other foreign investments (see Table 3.3).

Equity joint ventures, are as defined by the 1979 law on joint ventures. Chinese and foreign investors operate the venture in limited liability corporations and share the risks, profits and losses jointly. All parties involved agree on the equity share of each party. Equity investment may be in the form of equipment, cash, factory buildings or industrial property rights, and profits are distributed to the parties in proportion to their equity share. Until 1996, EJVs were the most popular entry vehicle. Although during recent years growth in WFOEs has been most rapid, EJVs still constitute the preferred form of FDI in China.

Wholly foreign-owned enterprises as the name suggests, are wholly owned by foreign investors. This form of foreign investment was not allowed in China by the 1979 law, but it was subsequently found acceptable and has been growing very rapidly especially in the 1990s (see Table 3.3). In 1998, as far as the contracted value is concerned, WFOEs actually involve higher amounts of committed investment than EJVs. As shown in Table 3.3, the amount under WFOEs was US$ 21.75 billion whereas the amount under EJVs was US$ 17.29 billion. Because the contracted value is often a major indicator of actual FDI in subsequent years, this means that WFOFs will very likely become the primary entry mode choice after 2000.

Table 3.3 Contracted value of FDI by form 1984-1999

US$ 10,000

	EJVs		WFOEs		CJVs		JEs	
	Projects	Value	Projects	Value	Projects	Value	Projects	Value
1984	741	106655	26	9991	1089	148402	-	-
1985	1412	202970	46	4566	1611	349615	4	35959
1986	892	137518	18	2030	582	135805	6	8081
1987	1395	195041	46	47116	789	128262	3	465
1988	3900	313389	410	48063	1621	162398	5	5856
1989	3659	265902	931	165378	1179	108322	10	20374
1990	4091	270395	1860	244381	1317	125410	5	19425
1991	8395	608005	2795	366695	1778	213783	10	9199
1992	34354	2912846	8692	1569617	5711	1325548	7	4340
1993	54003	5517427	18975	3045679	10445	2549998	14	30462
1994	27890	4019352	13007	2194866	6634	2030093	18	23666
1995	20455	3974142	11761	3365765	4787	1782507	8	5739
1996	12628	3187639	9062	2681032	2849	1429699	17	29272
1997	9001	2072634	9602	1765817	2373	1206610	19	40243
1998	8107	1728631	9673	2175270	2003	1165570	7	7750
1999	7050	1351520	8201	2070637	1656	680302	5	5850
Total	197973	26864066	95105	19756903	46424	13542324	138	246681

Source: China State Statistical Bureau

In a contractual joint venture (CJV) or co-operative enterprise, the Chinese partner provides land, natural resources, labour and equipment/facilities, while the foreign partner provides capital/technology, key equipment and materials. Both parties decide on the proportions in which products, revenue and profits are distributed. CJV form is also an important choice widely used by FDI firms. During 1984-1999, 46,424 CJVs projects were approved with contracted value US$ 135 billion account for 22 percent of total contracted value of FDI in the same period (see Table 3.4).

Joint exploration or co-operative development applies mainly to activities such as offshore oil exploitation, and returns are normally specified shares of the physical output. As shown in Table 3.4, only 138 projects were approved in JEs form account for less than 1 percent of total approved projects during the period of 1984-1999.

EJVs and WFOEs are the two most important forms of FDI in China as evidenced from the data in Table 3.4. During the period of 1984-1999, the Chinese government had approved 339980 foreign-invested projects. Among them, 197,973 were EJVs accounting for more than 58 percent of total projects, 95,105 WFOEs accounting for nearly 28 percent. EJVs and WEOEs have predominated over all other forms of FDI, accounting for approximately 80 percent of the total FDI inflows into China. This may be due to some of the advantages of EJVs and WFOEs as the forms of business. An EJV, under Chinese law, requires that the foreign partners contribute a minimum of 25 percent to the total cost of the project. The maximum contribution theoretically is 99 percent. Also an EJV has a separate legal status and takes the form of a limited liability company. Chinese and foreign partners contribute to the registered capital and share risks, profits or losses according to their contributions. From the

foreign partner's view, EJV provides immediate access to the Chinese market together with valuable local knowledge of the Chinese partner. From the local partner's perspective, EJV provides an opportunity for the transfer of advanced technology, managerial know-how and capital. Compared to EJVs, WFOEs also have inherent advantages. A WFOE offers the highest level of control over operations and strategies. Moreover, the foreign investors can wholeheartedly pursue their own goals and objectives and avoid the conflicts of interest and objectives that occur in partnerships with local firms. Because of lower dissemination risk, they would also be more willing to introduce their best products to the local market and even sacrifice short-term profits in order to gain a bigger market share. Within the constraints of the Chinese system, WFOEs allow MNCs to make fast decisions and act forcefully, thereby expanding as quickly as they want and where they want without the burden of an uncooperative partner.

Table 3.4 Cumulative contracted FDI by form 1984-1999

US$ 10,000

	Projects	%	Value	%
EJVs	197973	58.23	26864066	44.27
WFOEs	95105	27.97	19756903	32.56
CJVs	46424	13.65	13542324	22.32
JEs	138	0.04	246681	0.04
Others	-	-	-	-
Total	339980	100.00	60684260	100.00

Source: China State Statistical Bureau, computed by the author

3.4 The External Sources of FDI in China

Foreign investment has flowed into China from 150 countries and regions in the world. Hong Kong and Macao rank the first, accounting for more than half of total FDI in China over the period of 1985-1999, followed by the United States with 8 percent, Japan 7.8 percent and Taiwan 7.5 percent. The major Southeast Asian and West European countries also have considerable shares (see Table 3.5).

Table 3.5 Cumulative actually used foreign direct and other investment[4] by selected countries and regions 1985-1999

US$ billion

Countries	Amount	%	Rank
Hong Kong and Macao	161.5	50.78	1
United States	25.7	8.09	2
Japan	25.0	7.85	3
Taiwan[5]	24.1	7.57	4
Singapore	14.8	4.66	5
South Korea[6]	9.1	2.86	6
UK	7.5	2.35	7
Germany	4.9	1.53	8
France	3.3	1.05	9
Netherlands	2.2	0.69	10
Canada	2.1	0.65	11
Australia	1.8	0.57	12
Italy	1.6	0.52	13
Switzerland	1.2	0.37	14
Others	-	-	-
Total	318.1	100.00	-

Source: China State Statistical Bureau, computed by the author

[4] Other Foreign Investment includes sale share, international lease, compensation trade, and processing and assembly.
[5] The period of cumulative actually used foreign direct and other investment from Taiwan is 1990 to 1999.
[6] The period of cumulative actually used foreign direct and other investment from South Korea is 1992 to 1999.

In 1979, when China embarked on its economic reform, it had consciously targeted overseas direct investment from ethnic Chinese. For this purpose, the Chinese government first established four SEZs in Guangdong and Fujian provinces that traditionally had good ties with overseas Chinese in Southeast Asia. It came as no surprise that the first influx of foreign investment to China came just from its doorstep, as many Hong Kong and Macao businesses set up consignment processing plants in these SEZs. Although the average size of these investments was typically small, they represented the first major source of FDI received by China during the early years of reform. From 1985 to 1999 (see Table 3.6 for detail), the actually used investment from Hong Kong and Macao in China was a cumulative total of US$161.5 billion. Although the relative importance of investments has recently declined due to the arrival of other Newly Industrialised Economies (NIEs), Hong Kong and Macao still stand as the leading source of FDI of China, with more than 50 percent of FDI received by China coming from or through the islands. It should be pointed out that some of foreign investments in China actually come from domestic capital which took a 'round-tripped' way through Hong Kong then back to the mainland for taking advantage of the preferential tax policies provided to foreign investors. This caused the overvalued FDI in China (World Bank, 1997). With improvements in Chinese FDI statistical methodologies and reforms of FDI tax preferences, the magnitude of this problem should be reduced.

Table 3.6 Actually used foreign direct and other investment by source (selected countries and regions)

US$ 10,000

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
HK. and Macao	95568	132871	180905	242805	234177	211848	266181	790894	1803249	2033212	2062493	2145788	2195436	1983907	1774011
Japan	31507	26335	26664	59835	40768	52048	60952	74827	136137	208616	321247	369214	439037	344407	306358
Singapore	1013	1362	2163	3016	8654	5328	5821	12593	49180	117961	186061	224716	260696	340397	264252
Taiwan						22426	47189	105335	313913	339134	316516	348202	334234	305123	275857
Korea								12025	38149	72612	104710	150416	222763	180430	128025
UK	7135	3526	1381	4660	2898	1990	3788	3850	22051	68884	91520	130193	185956	117486	104494
Germany	2414	2691	1641	2450	9101	6938	16172	9128	6248	26412	39053	51887	100858	73673	137363
France	3254	4363	1726	3159	1163	2344	1170	4692	14141	19340	28702	42465	47586	71489	88429
Italy	1938	2940	2154	3622	3424	812	4130	2666	9989	20616	27020	16944	21811	27457	18744
Netherlands	13	294	24	2074	1773	2178	667	2841	8400	11105	11411	12517	41380	71882	54168
Switzerland		204	1763	1415	1155	158	1231	2944	4688	7160	7938	21441	21567	22882	24709
US	35719	32617	27129	24437	28820	46121	33066	51944	206785	249080	308373	344417	346117	417355	422255
Australia	1436	7877	497	416	4646	2515	1491	3505	11034	18826	23299	19406	31374	27832	26676
Canada	940	255	1126	602	2222	893	1140	5907	13688	21605	25704	33797	34413	31652	31449
World	195615	224373	264661	373966	377345	375487	466661	1129162	2777087	3394584	3780569	4213516	5238734	4755749	4244696

Source: China State Statistical Bureau

Due to political confrontations across the Taiwan Strait after 1949, Taiwan's investment in China started much later than Hong Kong's. It was after 1987, when cross-strait political tensions began easing and the Taiwan government officially permitted its citizens to visit the mainland, that Taiwanese businesses began actively investing in China. At the same time, changing domestic economic conditions such as the revaluation of the Taiwan dollar, rapid rise in wages and costs of land, increasing labour disputes, crime, and more demanding environmental protection regulations all contributed to the relocation of non-competitive productive activities overseas. On the other hand, in order to speed up cross-strait economic co-operation and the process of unification, the mainland government had purposefully targeted Taiwanese businesses and offered special incentive schemes to Taiwan firms. As expected, the mainland's strategies appeared to work quite well in attracting Taiwan's outward investment, as the mainland quickly became the largest destination for Taiwan's outflow investment. During 1990 to 1999, Taiwan investments reached a realised value of US$24.1 billion, accounted for about 7.6 percent of actual FDI received by China, making Taiwan the fourth largest source for the FDI in China (see Table 3.5).

As a member of the Association of Southeast Asian Nations (ASEAN)[7], Singapore's outflow FDI was mostly located in ASEAN countries, with Malaysia ranked as the top recipient. However, Singapore is a resource poor country, while it is in need of raw materials, inexpensive products, and offshore manufacturing, China needs manufactured products, machinery, advanced technical expertise, and management skills.

[7] ASEAN is an association of the Southeast Asian nations of Singapore, Malaysia, Indonesia, Thailand, and Philippines for security, diplomatic, and economic purposes. In November 1982, the economic ministers of the ember countries approved an agreement on joint industrial ventures which included 50 percent tariff reductions for approved products.

Thus, Singapore is in the position of being able to offer strategic alliances to international companies seeking a base from which to launch and manage investment projects in China. In addition, since Singapore established formal diplomatic relations with China in 1990, the Singapore government has staged an official campaign to promote business investment in China. As a result, from 1985 to 1999, Singapore's investment in China grew rapidly to a cumulative total realised value of US$14.8 billion, making it the fifth largest investor in China after Hong Kong, the United States, Japan, and Taiwan (see Table 3.5).

South Korea is the closest geographically of the main source countries of investment in China. Similarly, South Korean investment in China was quite moderate before 1992, they could only invest on a small scale and some investment projects indirectly passed through Hong Kong organisations. However, after South Korea and China established formal diplomatic ties and signed an investment protection agreement in 1992, Korean MNCs developed rapidly and became the nearest investors in China. In 1992, Korean investors committed US$ 120 million (see Table 3.6). Pushed by rising costs of production at home and pulled by the rapid growth of the Chinese domestic market, China had became the largest host country for Korea's outflow investment by 1993 and received actual investment US$ 381 million in the same year. In 1997, the investment from Korea jumped to the historical peak with US$ 2227 million. During only 8 years from 1992 to 1999, the investment from South Korea reached US$ 9.1 billion, ranked sixth for foreign investment in China (see Table 3.5).

As a group, the four East Asian dragons (Hong Kong, Taiwan, Singapore, and South Korea) have provided about 66 percent of the FDI in China by 1999. What has caused such a

strong NIEs bias in FDI towards China? There are the 'special factors' such as the close geographical proximity, pre-existing kinship, social network and tight culture affinity between NIEs and China. More importantly, they aim to capitalise on lower production costs, gain access to natural resources, circumvent protectionist measures of developed countries, and exploit firm-specific advantages such as lower managerial costs, better marketing channels, more appropriate technology and better understanding of host countries than investors from developed countries. The determinants for each country or area may not be totally the same, however, all four economies faced the structural adjustments since the mid-1980s behind the historic capital movement. From the mid-1980s, continual current account surplus and rapid accumulation of international reserves has placed tremendous pressure for the exchange rates of these countries to appreciate against the US dollar. Inflationary pressure following the rapid accumulation of international reserves has also greatly raised domestic wages and land costs, causing a shift in the comparative advantage of these economies and prompting many firms to relocate parts of their productive activities overseas. In the meantime, the United States and the European Union terminated the General System of Preference (GSP)[8] privileges in 1989 to NIEs, further forcing some of their labour-intensive "sunset" industries to be transferred to places where these privileges still apply. In order to face the structural adjustment induced by both the internal and external conditions, many businesses in NIEs have chosen to go global and invest in China in the same labour-intensive industries, such as textiles, garments, electronics, electrical goods, metal, plastics, and toys.

[8] Generalised System of Preferences: A system of tariff reductions granted by the European Economic Community to developing countries. The EEC was the first major trading power to introduce generalised preferences in 1971. USA system of tariff reductions offered by the United States of America to poorer countries allowing more favoured treatment in trade.

By doing so, they could utilise China's goods and factor markets to overcome their rising domestic production costs and the limits of their small domestic markets. To summarise, the motivations of NIEs refer more to the factor cost advantage and growing demand of the Chinese market.

Compared to their presence in other countries, developed countries have invested only a small share of their outflow FDI in China. Japan has invested less than 2 percent of its overseas investment in China. Most Japanese firms preferred to trade rather than to invest in China and most of Japan's FDI was to ASEAN in the late 1980s, and only during the 1990s has there been a notable shift in this trend and increasing investment in China. Japan has been spurred to invest more as a result of the yen's appreciation and increasing competition from NIEs. From 1985 to 1999, Japan invested a cumulative total of US$25 billion, accounting for about 7.9 percent of actual FDI received by China (see Table 3.5). This number is rather scanty, in light of Japan's economic size and its investment in other countries.

While the United States was among the earliest investors in China, its share of investment accounts for only 8 percent of the FDI received by China (see Table 3.5), next in importance to Hong Kong and Macao. This number reflects a rather limited engagement of US investment in China, in view of the country's economic scale and its investment in other countries. The relatively low engagement partly reflects the difference in expectations between the US and NIE businesses about the prospects of the Chinese economy. It may also reflect the difference in business strategies and market opportunities for the US multinationals, which appear to be more interested in the Chinese domestic market rather than in its cheap labour. Grub et al. (1990) have used interviews and questionnaires to study

the motivations of US firms in China. They found that foreign exchange problems (non-convertibility of the currency and multiple exchange rate system) were most serious for the US firms. The cumbersome bureaucracy and the lack of infrastructure facilities were also serious problems hindering US investments. Swings in economic policies and too many controls over FDI also discouraged US investments into China.

Relative to Japan and the United States, European investments in China have been even more sluggish. In the 1985-1999 period, the four major European countries of Germany, France, Britain, and Italy together accounted for less than 6 percent of FDI in China. The sluggishness of European investments in China can be attributed to an economic recession lasting from the late 1980s to the early 1990s and the growing diversion of investment to locations near home, such as former republics of the Soviet Union and Eastern Europe.

It is important to examine what caused the under-investment of developed countries in China. In addition to the above descriptions, some more formal considerations may be worthwhile. Theoretically, the prospective benefits obtained from FDI are common to all investors regardless of their country of origin. These benefits include market access, cost reduction, efficiency improvement, market expansion, and risk diversification. However, because of the different nature of firm-specific competencies possessed by investors from different origins, the strategic motivation of FDI continues to vary between these origins. International investors from NIEs often undertake outward FDI to maximise benefits from such rent-generating competencies as ethnic networks, knowledge of foreign markets, product designing, and international distribution. Unlike these investors, MNCs based in developed countries seek to exploit potentials derived from their distinctive resources and

capabilities. These include advanced technology, product and process innovation, economy of scale and scope, risk-reduction capacity, and internalisation advantages.

Apart from internal strengths, home-government policies toward outward FDI constitute another major source of variance in strategic characteristics between NIEs and developed-country investors. In general, home governments in NIEs provide more encouraging policies for outward FDI than those in developed countries. It is observed that governments in many newly industrialised developing countries, such as Singapore, South Korea, and Taiwan, furnish enormous aid in skill-labour training, financing, tax reduction, domestic market-share protection, and other such applicable areas.

The relatively low engagement of developed countries (especially the western countries excluding Japan) may reflect heterogeneous expectations of the businesses in NIEs and in developed countries about the credibility and feasibility of the Chinese reforms and policies. Also the investors in NIEs and developed countries may have different sensitivities to the institutional barriers for FDI in China. For example, the cultural and language similarities between NIEs and China imply lower transaction costs and risks for the NIE-invested firms in the Chinese economic system, hence giving these firms an advantage over the firms from developed countries. In addition, the technological intensity and capital requirements of the production processes in developed countries are generally high, thus requiring sound infrastructure and a pool of skilled labour to support efficient operation of investment. By contrast, the production technologies and processes used by NIEs are relatively low-tech and labour-intensive in nature and thus are readily adaptable to the current market and factor endowment conditions in China. Furthermore, the costs of developing knowledge and

technology are high in developed countries. A sound system of intellectual property rights thus is required to minimise the risks of transferring technologies associated with FDI. The system lack of credible property rights in China thus may have impeded large-scale investments from developed countries. According to Linder's theory[9] (1961), the huge gap in per capita income between China and developed countries implies a limited overlap of market structure between the former and the latter. By contrast, the relatively smaller differences in per capita incomes between China and NIEs imply broader overlapped market segments between China and NIEs, which may induce a greater investment from NIEs to take advantage of these opportunities. Finally, the global trend of "regionalisation" may have diverted some of the western investments from China.

3.5 The Determinants of FDI Inflows into China

The evidence from previous empirical studies show that market-size, labour costs, tariff barriers, political stability, currency exchange rate, bilateral trade, geographic distance and culture differences are the important location determinants of FDI (Wang and Swain, 1995; Dees, 1998; Liu et al., 1997; Przybylska and Malina, 2000; Culem, 1988; Chakrabarti, 2002; Braunerhjelm and Svensson, 1996; Yang et al., 2000).

[9] The closer together are countries in their per capita incomes, the greater the volume of trade in manufactured goods which they will conduct with each other, since foreign trade is regarded as an extension of domestic production and consumption. Goods are produced first for the home market and when the volume of output increases, export markets are sought.

Market-size is a crucial determinant in the decision-making process concerning FDI and market conditions play the most important role in designing the international investment strategy (Przybylska and Malina, 2000). It is expected that the larger the host country market, the more FDI inflows. However, host market motive of FDI may be more concerned with the market size than export motive of FDI. Also comparing the relative change in market size of the home and host country, the host country market will be more attractive than in home country if the host country market expands more rapidly than the home country market (Wei and Liu, 2001). The real GDP, the growth rate of GDP, and per capita of GDP are often used to measure market size. The growth rate of GDP may be seen as a measure of the future potential of the host country's domestic market and the level of per capita GDP may be used to reflect the level of the host country's economic development (Yang et al., 2000).

The neo-classical hypotheses suggested that low labour cost played an important positive role in decisions to invest overseas. 'Other things being equal, firms are expected to prefer lower wage locations. Of course, a lower hourly wage is attractive only insofar as it is not compensated by a lesser productivity or an overvalued currency' (Culem, 1988). Moreover, the bigger the wage differences between the home and host countries the more the former invest in the latter (Wang and Swain, 1995).

According to the international trade hypothesis, the higher the tariff and other trade barriers, the higher the flow of investment is likely to be. An increase in tariff protection in the host country provides an incentive for the multinational to expand its subsidiary as against serving it through exports because the higher tariff makes foreign goods relatively more expensive and less competitive than domestic goods.

It is expected that the higher political stability in the host country that may be reflected in a higher probability of revenues from production of multinationals in the host country, so the more FDI inflows from the home country. This determinant is important particularly in the centrally planned economies and developing countries.

Most economists suggested that devaluation of a country's currency encourages inflows of FDI and discourages outflows of FDI. A rise in the exchange rate in terms of the host country currency over the home country currency implies a devaluation of the host country currency. A real devaluation of the host country's currency leads to a decline in the price of all production factors and decreased production costs of multinationals in the host country, which in turn make them more competitive in international markets.

According to Linder's theory (1961), Grosse and Trevino (1996) pointed out that firms from countries with similar per capita income to the host country will undertake more FDI in the host country. The similarity of demand patterns that leads to bilateral trade flows among the countries should also translate into bilateral direct investment flows to serve each other's markets. However, as to an individual firm, the story may be changed. If export costs such as transportation cost, tariff and non-tariff trade barriers are high, the firm may be willing to undertake FDI to set up affiliates in the host country rather than exports to the host country, which indicates trade and FDI are substitutes each other.

The distance of the home country from the host country is also considered to be an important determinant of FDI location. It can be measured by geographic distance and culture distance. The geographic proximity could reduce the costs of obtaining information,

monitoring and managing the affiliate in the host country market. Also cultural similarity encourages FDI inflows because multinationals need to hire and train local workers. The greater difficulty of entering the host market due to distance should lead to lower amounts of FDI. In terms of transportation cost, multinationals should prefer to invest in nearby countries. However, Chakrabarti (2002) pointed out that a rise in external transportation cost discourages the export motive of FDI but may encourage the host market motive of FDI.

To understand the determinants of FDI inflows, Streak and Dinkelman (2000) argued that the determinants vary across the four types of FDI (efficiency, market, natural resource and strategic asset seeking) which classified basing on FDI motivation. Market seeking FDI, which is carried out by horizontally integrated MNCs, is influenced primarily by market size, structure and growth of local and common markets, economies of scale, host government policy, transport costs, political and economic stability, and geographic distance. Resource and efficiency seeking FDI is affected more by the availability and cost of natural resources and labour, the productivity and skills of labour, technology capability and infrastructure, the efficiency of government institutions, external economies generated by industrial districts, the value of the exchange rate, proximity to leading export markets. Asset seeking FDI prefer to specific technology capabilities in particular industries and countries.

Liu et al. (2001) investigated the economic, political and cultural determinants of both pledged and realised FDI in China by using an error-components model. The panel data set employed covers the time period of 1983-1994, 22 home countries and regions in the case of pledged FDI and the time period of 1984-1994, 17 home countries for realised FDI, respectively. Hong Kong, NIEs countries, the US, and the main European countries are taken

into account as the home countries. The empirical results indicated that FDI inflows are positively associated with China's relative market size and economic integration represented by real exports and imports, but negatively related to China's relative real wage rates, country risk and cultural differences while geographic distance is not a significant determinant. Similar empirical results were obtained from the studies of Wang and Swain (1995) and Dees (1998). The findings from these studies have important policy implications for the Chinese government for the future development of FDI in China. The Chinese government should further open domestic markets, stimulate bilateral and multilateral trade with the rest of the world. Another more important aspect particular to the Chinese government is to maintain its political certainty and the country stability. China's entry into the WTO should also help China further improve its trade and FDI policy regimes, ameliorate the investment environment, which in turn should attract more FDI inflows.

3.6 Conclusions

Over the past two decades China has been remarkably successful in attracting FDI. During the period of 1979-1999, the Chinese government approved over 340 thousand FDI projects with totally actually used FDI over US$ 300 billion. This chapter has described the background of FDI in China regarding the evolution of policies, the development process, the main forms, the external sources, and the determinants of FDI inflows in China.

Based on the brief introduction of Section 3.1, Section 3.2 focuses on the evolution of Chinese government policies and the development of FDI in China. The growth of FDI in

China can be distinguished into three different phases: the first phase from 1979-1983 is a sluggish stage, the second phase from 1984-1991 is an increasing stage, and the third phase after 1992 is a rapidly increasing stage. For attracting FDI inflows into China, Chinese government issued a series laws and preferential policies. As a result, China became the largest recipient of FDI among developing countries and the second largest in the world just after the United States and the amount of actually used FDI in China reached its peak in 1997 and 1998 with over US$ 45 billion.

Section 3.3 discusses the main forms of FDI in China. Equity joint ventures (EJVs) used to be a dominant form used by FDI firms. However, in recent years this pattern has changed, the wholly foreign-owned enterprises (WFOEs) have been growing very rapidly to become the most important form of FDI in China.

Section 3.4 states the external sources of FDI in China. Foreign investment has flowed into China from 150 countries and regions in the world. Interestingly, of the top ten foreign sources, five are Asian countries and regions, which are Hong Kong/Macao, Japan, Taiwan, Singapore, and South Korea, collectively contributing about 73.72 percent during 1985-1999. In the same time, the United States and European countries accounted for only 13.71 percent. The accumulated amount of FDI over the last two decades also shows that FDI contributed by Asian countries and regions was more than five times that contributed by the western ones. The dominance of Chinese community investors from Hong Kong/Macao, Taiwan, and Singapore in providing FDI to China can be traced to both internal and external factors. From an internal perspective, their complementary competence, geographic proximity, ethnic ties, and similar business cultures constitute critical contributions fostering dominance. From an

external perspective, host and home government policies, market demand similarities are also important factors promoting dominance.

Section 3.5 analyses the national location determinants of why foreign investors choose China as the destination of their investment. According to the previous empirical studies, FDI inflows are positively associated with China's relative market size and economic integration represented by real exports and imports, but negatively related to China's relative real wage rates, country risk and cultural differences. The following chapter will further discuss the regional location determinants of why foreign investors choose the specific regions in China for their MNCs.

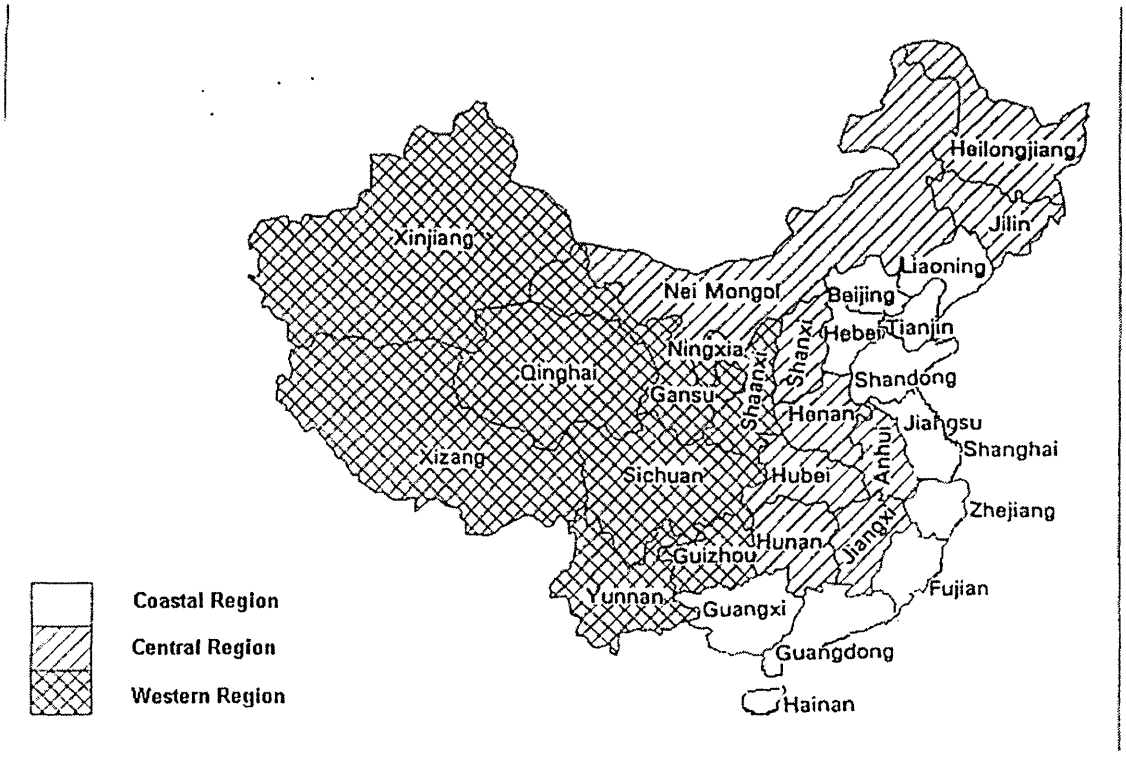
CHAPTER 4

THE REGIONAL LOCATION DETERMINANTS OF FDI IN CHINA

4.1 Introduction

Due to the enormous different regional characteristics in terms of natural and social resources, endowments, historical and economic development, China is divided into three macro-regions: the eastern coastal, central, and western regions (see Figure 4.1). This framework is widely used in analysis of Chinese regional economies also pursued in the Five-Year Plan by the Chinese government.

The coastal region, which is relatively more developed, includes three central municipalities Beijing, Tianjing, Shanghai and nine provinces Hebei, Liaoning, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi, and Hainan. The central region includes eight provinces Heilongjiang, Jilin, Shanxi, Henan, Anhui, Hubei, Hunan, Jiangxi and one autonomous region Nei Mongolia. The western region, which is considerably less developed and poorer than the coastal and the central regions, includes one central municipality Chongqing, six provinces Shaanxi, Gansu, Sichuan, Qinghai, Guizhou, Yunnan and three autonomous regions Xinjiang, Ningxia and Tibet (Xizang).



Source: China State Statistical Bureau, modified by the author

Figure 4.1 Three macro-regions of China

With increasing inflows of FDI into China, the geographical distribution of the cumulative FDI in China is significantly characterised by its high concentration in the eastern coastal region, which is relatively more developed. This spatial pattern is similar to the pattern of global FDI distribution in the world.

The cross-country distribution of FDI in the world has remained highly skewed (Chakrabati, 2002). In 1999, nearly 58% of global FDI went to developed countries. By contrast, only 37% flowed into developing countries and 5% to the transition economies of Eastern Europe. With more disparity among the developing countries, China absorbs nearly 40% of the FDI inflows to the developing countries. China's admission to the WTO also makes China a more attractive destination for FDI.

During the period 1979-1999, about 88 percent of FDI was received by the eastern coastal region of China, embracing just 9 provinces (including 3 central municipalities). By contrast, the remaining 12 percent is located in the vast inland (9 percent in central and 3 percent in western) regions, which are considerably less developed and poorer, covering 18 provinces and autonomous regions (see Table 4.1).

Table 4.1 Cumulative actually used FDI by three macro-regions 1985-1999

US$ 10,000

	FDI	%
Coastal Region	26,005,322	88
Central Region	2,661,927	9
Western Region	945,021	3
Total	29,612,270	100

Source: China State Statistical Bureau, computed by the author

As a host country of FDI, this phenomenon of the skewed spatial pattern presents the Chinese authorities with challenges to overcome if FDI is to continue to help the country's record growth rate and further its economic development. Moreover, one dominant task of the Tenth Five-Year Plan (2001-2005) of China is to develop the western region, covering 56 percent of the country's total land and 23 percent of the nation's population, which is in greater need of capital investment (Cheng, 2000). This task has raised interesting and essential questions as to the theoretical explanation and empirical analysis of the regional potential determinants affecting the FDI location decision.

In Section 3.5 of the last chapter, we discussed why foreign investors would choose to invest in a particular host country. In this chapter, we will further discuss why foreign investors would choose to invest in a specific regional location within a particular host country, in the case of China. By doing so, we try to shed some light on how the FDI location choice is influenced by regional characteristics in China and what the government should do to enhance the chances of the western region to attract FDI.

The rest of the chapter is organised as follows. Section 4.2 analyses the causes of disparities among the three macro-regions of China. Section 4.3 reviews selected literature. Section 4.4 discusses the estimation model, data, and methodology. Section 4.5 conducts empirical analysis and the last section summarises the key conclusions and policy implications.

4.2 The Causes of Disparities Among the Three Macro-regions

Geography plays a very important role in regional difference in China's economy. China is a huge country with a vast land area of 9.6 million square kilometres, which is similar in size to the United States. However, the topography is quite different, China is mountainous and hilly especially in the inland area. This implies unfavourable natural conditions for economic development because of the higher costs of transportation and infrastructure construction. The topographical feature of China is a three-step "staircase" stepping down from west to east (Bao, et al., 2002).

The first highest step is Qinghai-Tibet (Xizang) Plateau of 4000m elevation in the west of China. The second step is the central region where the topography slopes down from plateau to highlands and basins, in which mostly are from 2000m to 1000m above sea level. The third step is the eastern coastal region, which further descends to hills and plains below 1000m elevation. Comparatively, the eastern region has more favourable natural conditions for production, trade, and economic development. Thus the country's economy and population are concentrated in this area.

According to the growth pole theory, a concentration of population is conducive to economic development, which later spreads to peripheral areas (Song, et al., 2000). Regional inequality is a direct consequence of the growth pole process, as the high-population region grows faster and achieves higher income and economic development levels than other areas.

Geographically, inland regions have inferior ecological conditions and are also more remote to the coast. Both factors have hindered economic development in these areas and limited their accessibility to outside markets, both domestic and international. Another important disadvantage for the inland regions is lack of hometown connections of overseas Chinese. For historical and geographical reasons, most overseas Chinese have origins in the coastal areas, few in the inland areas. As mentioned in Section 3.4 of Chapter 3, nearly 60 percent of FDI has come from Hong Kong, Macao, and Taiwan during the period of 1985 to 1999, which indicates that overseas Chinese have made a major contribution in bringing in FDI. Relative to the

inland regions, the coastal region has a much stronger overseas Chinese hometown connection and received much more FDI. This makes the economy in the eastern region grow faster, further leading to larger regional disparities.

China is also a country in which the government is highly involved in economic activities. Before the economic reforms in 1978, China was a centrally planned economy. Since then, the government has still played a crucial role in economic development. Therefore, regional disparities are caused not only by historical and geographical factors but also by regional development policies of the government. In the first 30 years since 1949, "even development" was the theme of regional economic policies. China was basically an agricultural economy although some heavy industries were developed during the early 1950s with assistance from the Soviet Union and some others built by the Chinese themselves in the 1960s and 1970s. In the 1960s, the "Third Front" construction[10] shifted a lot of resources including labour and capital from the coastal region to the inland regions especially in Sichuan, Yunnan, Guizhou, Hubei, Henan, and Shaanxi provinces. The objective was to create an entire industrial structure. In doing so, some railway lines, steel mills, and automobile plant were constructed in the inland regions. The eastern region remained stagnant and the gap between the two inland regions and the eastern region was not substantial at the time. However, regional economic policies moved away from the "even development" strategy since China conducted the economic reform and open-up policy. After many preferential policies were offered to foreign investors in the eastern coastal region (see Section 3.2 of Chapter 3), the gap among the three regions

[10] Between 1964 and 1971, China under Mao's leadership carried out a massive program of investment in the remote inland regions. This development program called "Third Front" construction was aimed at the creation of a huge self-sufficient industrial base area to serve as a strategic reserve in response to a perceived external threat.

has been growing rapidly. Relatively, more government capital was invested in the eastern region than in the central and western regions. During the Seventh Five-Year Plan (1986-1990), the ratios of capital investment across the three regions were 100:53:30 (Song, et al., 2002). Beijing, Shanghai, Tianjin, Liaoning, and Guangdong are the five areas in the coastal region with highest per capita investment directly from the government. The practice of SEZs, the coastal open cities, and the special economic deltas further strengthens the competitiveness of the coastal region, which increased regional disparities among the three regions.

Table 4.2 shows actually used FDI in the provinces (also divided into three macro-regions by coastal, centre and western region, respectively) of China during the period of 1985 to 1999 from which we can clearly see the concentration of FDI flows into the coastal region. Among the twelve coastal provinces and central municipalities, Fujian, Shanghai, Jiangsu, and Guangdong attracted the lion's share of FDI. Guangdong especially has consistently been the leading coastal destination during the years. By contrast, the provinces in central and western regions received much less FDI located particularly before 1990. The situation has slightly changed since 1992 when the orientation of government policy shifted from the coastal to inland regions, the shares of FDI in the central and western regions have been slowly increasing (see Table 4.3).

Table 4.2 Actually used FDI by three macro-regions 1985-1999

US$ 10,000

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Coastal Eastern Region	Beijing		13994	9534	50278	31846	27695	24482	34985	66694	137157	107999	155290	159286	216800	197525
	Tianjin	4409	2931	12741	3185	2801	3493	13216	10724	54100	101499	152064	200637	251135	211361	176399
	Hebei	393	685	744	1673	2686	3935	4437	11019	39654	50948	54175	82587	110064	142868	104202
	Liaoning	1569	4128	6450	11525	11857	24373	34888	48956	126269	143676	142175	173768	220470	219045	106173
	Shanghai	6242	14765	21366	23317	42212	17401	14519	48108	316025	247309	289261	394094	422536	360150	283665
	Jiangsu	1191	1811	4651	10303	9358	12416	21232	146004	284371	376315	519082	521009	543511	663179	607756
	Zhejiang	1634	1853	2337	2957	5181	4843	9162	23239	103175	114441	125806	152050	150345	131802	123262
	Fujian	11782	6149	5139	13017	32880	29002	46629	141634	286745	371200	403881	408451	419666	421211	402403
	Shandong	559	1939	2381	4309	13132	15084	17950	97335	184319	253153	260719	259041	249294	220274	225878
	Guangdong	51529	72268	60299	95786	115644	146000	182286	355150	749804	939708	1018030	1162362	1171083	1201994	1165750
	Guangxi	1251	3695	3774	2065	4594	2866	2532	17833	87203	81506	66952	65618	87986	88613	63512
	Hainan				11421	9497	10302	17616	45255	70710	91809	106207	78908	70554	71715	48449
Central Region	Shanxi	43	15	227	652	882	340	380	5384	8643	3170	6383	13802	26592	24451	39129
	Inner Mongolia		98	109	337	24	1064	110	520	8526	4007	5200	7186	7325	9082	6456
	Jilin	252	57	18	620	335	1760	1800	6597	23784	24152	39876	45155	40227	40917	30120
	Heilongjiang	226	1742	1132	4009	2241	2449	943	7050	23232	34176	45018	54841	73485	52639	31828
	Anhui	163	794	139	1151	478	961	954	5002	25764	37000	48256	50661	43443	27673	26131
	Jiangxi	517	458	393	518	587	621	1949	9653	20817	26168	28796	30068	47768	46496	32080
	Henan	565	605	450	6418	4266	1049	3791	5215	30294	38567	47622	52356	69204	61654	52135
	Hubei		1241	1190	2231	2295	2900	4643	20308	53770	60183	62474	68004	79019	97294	91488
	Hunan	1761	948	235	771	643	1116	2276	12853	43267	32511	48802	70344	91702	81816	65374
Western Region	Sichuan		1523	2123	2361	801	1604	2439	10185	55981	88859	53940	42544	63521	80355	57994
	Guizhou	148	220		440	747	468	734	1979	4294	6363	5703	3138	4977	4535	4090
	Yunnan	156	354	480	310	740	261	296	2313	9702	6500	9769	6537	16566	14568	15385
	Shaanxi	1374	3716	7278	11173	9719	4191	3159	4553	23430	23880	32407	32509	62816	30010	24197
	Gansu	295	42	21	200	111	85	93	35	1195	8776	6392	9002	4144	3864	4104
	Qinghai				270				68	324	241	164	100	247		459
	Ningxia	25	5	3	30		25	18	352	1190	727	390	555	671	1856	5134
	Xinjiang	157	1281	1751	504	88	537	22		5300	4830	5490	6390	2472	2167	2404

Source: China State Statistical Bureau

Table 4.3 Share of actually used FDI in provinces to national total

(%)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Coastal Region	93.4	90.5	89.3	87.8	92.2	93.9	94.3	91.4	87.5	87.9	87.9	88.1	85.9	87.2	87.8
Beijing		10.2	6.58	19.2	10.4	8.74	5.93	3.26	2.46	4.15	2.92	3.74	3.55	4.79	4.95
Tianjin	5.11	2.13	8.79	1.22	0.92	1.1	3.2	1	2	3.07	4.12	4.84	5.59	4.67	4.42
Hebei	0.46	0.5	0.51	0.64	0.88	1.24	1.08	1.03	1.46	1.54	1.47	1.99	2.45	3.15	2.61
Liaoning	1.82	3.01	4.45	4.4	3.88	7.69	8.46	4.57	4.66	4.34	3.85	4.19	4.91	4.84	2.66
Shanghai	7.24	10.8	14.7	8.91	13.8	5.49	3.52	4.49	11.7	7.47	7.83	9.5	9.41	7.95	7.1
Jiangsu	1.38	1.32	3.21	3.93	3.06	3.92	5.15	13.6	10.5	11.4	14.1	12.6	12.1	14.6	15.2
Zhejiang	1.89	1.35	1.61	1.13	1.7	1.53	2.22	2.17	3.81	3.46	3.41	3.67	3.35	2.91	3.09
Fujian	13.7	4.48	3.54	4.97	10.8	9.15	11.3	13.2	10.6	11.2	10.9	9.85	9.35	9.3	10.1
Shandong	0.65	1.41	1.64	1.65	4.3	4.76	4.35	9.08	6.8	7.65	7.06	6.25	5.55	4.86	5.66
Guangdong	59.8	52.6	41.6	36.6	37.8	46.1	44.2	33.1	27.7	28.4	27.6	28	26.1	26.5	29.2
Guangxi	1.45	2.69	2.6	0.79	1.5	0.9	0.61	1.66	3.22	2.46	1.81	1.58	1.96	1.96	1.59
Hainan				4.36	3.11	3.25	4.27	4.22	2.61	2.77	2.88	1.9	1.57	1.58	1.21
Central Region	4.09	4.34	2.69	6.38	3.84	3.87	4.08	6.77	8.79	7.86	9	9.46	10.7	9.76	9.38
Shanxi	0.05	0.01	0.16	0.25	0.29	0.11	0.09	0.5	0.32	0.1	0.17	0.33	0.59	0.54	0.98
Inner Mongolia		0.07	0.08	0.13	0.01	0.34	0.03	0.05	0.31	0.12	0.14	0.17	0.16	0.2	0.16
Jilin	0.29	0.04	0.01	0.24	0.11	0.56	0.44	0.62	0.88	0.73	1.08	1.09	0.9	0.9	0.75
Heilongjiang	0.26	1.27	0.78	1.53	0.73	0.77	0.23	0.66	0.86	1.03	1.22	1.32	1.64	1.16	0.8
Anhui	0.19	0.58	0.1	0.44	0.16	0.3	0.23	0.47	0.95	1.12	1.31	1.22	0.97	0.61	0.65
Jiangxi	0.6	0.33	0.27	0.2	0.19	0.2	0.47	0.9	0.77	0.79	0.78	0.73	1.06	1.03	0.8
Henan	0.66	0.44	0.31	2.45	1.4	0.33	0.92	0.49	1.12	1.17	1.29	1.26	1.54	1.36	1.31
Hubei		0.9	0.82	0.85	0.75	0.92	1.13	1.89	1.99	1.82	1.69	1.64	1.76	2.15	2.29
Hunan	2.04	0.69	0.16	0.29	0.21	0.35	0.55	1.2	1.6	0.98	1.32	1.7	2.04	1.81	1.64
Western Region	2.5	5.2	8.04	5.84	3.99	2.26	1.64	1.82	3.74	4.24	3.09	2.43	3.46	3.03	2.85
Sichuan		1.11	1.46	0.9	0.26	0.51	0.59	0.95	2.07	2.69	1.46	1.03	1.41	1.77	1.45
Guizhou	0.17	0.16	0	0.17	0.24	0.15	0.18	0.18	0.16	0.19	0.15	0.08	0.11	0.1	0.1
Yunnan	0.18	0.26	0.33	0.12	0.24	0.08	0.07	0.22	0.36	0.2	0.26	0.16	0.37	0.32	0.39
Shaanxi	1.59	2.71	5.02	4.27	3.18	1.32	0.77	0.42	0.87	0.72	0.88	0.78	1.4	0.66	0.61
Gansu	0.34	0.03	0.01	0.08	0.04	0.03	0.02	0	0.04	0.27	0.17	0.22	0.09	0.09	0.1
Qinghai				0.1				0.01	0.01	0.01	0	0	0.01		0.01
Ningxia	0.03	0	0	0.01		0.01	0	0.03	0.04	0.02	0.01	0.01	0.01	0.04	0.13
Xinjiang	0.18	0.93	1.21	0.19	0.03	0.17	0.01		0.2	0.15	0.15	0.15	0.06	0.05	0.06

Source: China State Statistical Bureau, computed by the author

4.3 Literature Studies

Most studies of the regional location of FDI have been conducted for developed countries (Culem, 1988; Guimaraes, et al., 2000; Billington, 1999; Hill, and Munday, 1995; Yang, et al., 2000; Veugelers, 1991), especially for the USA (Coughlin, et al., 1991; Grosse, and Trevino, 1996). Some studies have focused on developing countries (Agarwal, 1990; Hamar, 1999; Streak, and Dinkelman, 2000).

As noted in the last chapter, the locational determinants of FDI are conventionally modelled in terms of foreign investors. Market size, economies of scale, and relative factor prices are considered to be the main determinants of FDI (de Mello, 1997). Table 4.4 shows the summary of the studies by their main aspects.

A number of studies investigated the regional locational determinants of FDI in China such as Gong, 1995; Chen, 1996; Broadman and Sun, 1997; Li and Li, 1999; Wei et al., 1999; Cheng and Kwan, 2000; Sun et al, 2002. They conducted the studies by using different data sets and methodologies, also the empirical results they obtained show some similarities and differences.

Table 4.4 Summary of the studies of determinants of FDI

Studies	Countries	Data/Econometric technique	Significant determinants/ coefficient sign
Culem (1988)	US Germany France UK Netherlands Belgium	Panel data (1969-82) OLS, GLS	Market size + Market growth + Tariff – Wage – Export + Interest rate +
Hill and Munday (1995)	France UK	Panel data (1986, 1988-90) OLS	Financial assistance + Manufacturing wage – Regional well-being +
Veugelers (1991)	OECD countries	Cross section (1980) OLS	GDP + Gross fixed capital – Distance + Tariff – Language dummy + Neighbour dummy +
Yang, et al. (2000)	Australia	Quarterly data (Sep.1985-Mar.1994) DW, LM	Interest rate + Wage + Openness – Industrial disputes + Inflation rate –
Guimaraes et al. (2000)	Portugal	Annual data (1985-92)	Agglomeration + Labour cost + Education – Population density +
Coughlin et al. (1991)	US	Panel data (1981-83) Maximum likelihood	Income + Density of manufacturing activity + Wage – Unemployment rate + Unionisation rate + Tax – Transportation infrastructure +
Grosse and Trevino (1996)	US	Panel data (1980-91) LSDV (FEs), REs	Bilateral trade + Market size of home country + Exchange rate – Distance –
Przybylska and Malina (2000)	Poland	Time series data (1990-98) Linear regression and Multiple regression	Market size + Exchange rate + Growth rate of OECD countries + Cost of capital – Import + Private sector +
Agarwal (1990)	Pacific-rim developing countries	Pooled data (1978-86) OLS	Income + Economic aid (coefficient signs are various in different countries)

(Table 4.4 continued)

Gong (1995)	China	Cross-section data (174 cities) (1989) Linear regression model	Power supplies + Seaports + Water transportation + Communication + Investment incentives +
Chen (1996)	China	Panel data (1987-1991) Conditional logit model (CLM)	Market share extension + Interregional railroad connection + Innovation of domestic Chinese industries –
Wei et al. (1999)	China	Panel data (1986-1995) "t-bar" test for unit roots	Level of international trade + Level of wages Infrastructure + Degree of agglomeration +
Cheng and Kwan (2000)	China	Panel data (1985-1995) GMM	Large regional markets + Good infrastructure + Preferential policy + Wage costs – Previous FDI +
Sun et al. (2002)	China	Panel data (1986-1998) general pooled regression model	Wages before 1991 + Wages after 1991 – GDP after 1991 + Labour quality + Good infrastructure + Cumulative FDI –

Gong (1995) conducted the study on locational determinants of FDI by using data of 174 cities in China. His results indicated that cities with better power supplies, seaports, water transportation, communication, and investment incentives provided more favourable locations for foreign investment.

By using a conditional logit model (CLM) and pooled cross-section and time-series data covering the period of 1987-1991, Chen (1996) found that the potential for market share extension affected FDI, while labour cost did not affect FDI in the central region. Furthermore, foreign investors in the western region seemed to have

taken advantage of the region's mineral and energy resource abundance. He suggested that interregional railroad connections were important in determining the locational choice of foreign investors.

Wei et al. (1999) analysed the determinants of the regional distribution of both pledged and realised FDI in China by using panel data analysis and a standardised 't-bar' test for unit roots. The empirical results indicate that there exists a long run relationship between the spatial distribution of FDI and a number of regional characteristics such as the level of international trade, level of wages, infrastructure and degree of agglomeration.

Cheng and Kwan (2000) estimated the effects of the determinants of FDI in 29 Chinese regions between 1985 and 1995 by using Generalised Method of Moments (GMM). They found that large regional markets, good infrastructure, and preferential policy had a positive effect, while wage costs had a negative effect on FDI. The effect of education was positive but not statistically significant. In addition, there was also a strong self-reinforcing effect of FDI on itself.

Sun et al. (2002) analyse the spatial and temporal variation in FDI among China's 30 provinces from 1986 to 1998. They split the sample into two phases: pre- and post-1991 periods because, as stated in Chapter 3, FDI development in China takes different stages and 1991 marks the end of the second phase of FDI development. They found that the importance of the FDI determinants changes through time. Wages have a positive relationship with FDI before 1991 but negative after then. Similarly,

provincial GDP bears no significant relationship with FDI before 1991 but becomes highly positive after 1991. Labour quality and infrastructure are also important determinants of the distribution of FDI. High labour quality and good infrastructure attract FDI inflows. They also found a surprising but important result from the empirical study that the cumulative FDI relative to cumulative domestic investment has a negative impact on new FDI. Therefore, they argue that the provincial officials have to improve the investment environment otherwise FDI firms may choose to invest in provinces with fewer FDI competitors.

While explaining the uneven location of FDI in China, other studies (Wu, 2000; Broadman, and Sun, 1997) focus on 'special factors' such as the close geographical proximity, pre-existing kinship, social networks and tight culture affinity especially between Hong Kong, Macao, Taiwan and southern China e.g. Guangdong and Fujian provinces.

4.4 Model, Data, and Methodology

Based on previous studies, we try to identify the potentially important determinants of FDI distribution across the different regions in China. The location choice model used in this study incorporates traditional industrial location theory that explains the geographical distribution of FDI in terms of transport costs, wages and infrastructure and the new location theory that focuses on agglomeration economies (Guimaraes et al., 2000; Cheng and Kwan, 2000; Wei et al., 1999).

According to traditional industrial location theory, FDI is assumed to be a function of the size of the regional market in any period because it directly affects the expected revenue of the investment. In fact, one main motivation of FDI is to look for new markets. The larger the market size of a particular province, *ceteris paribus*, the more FDI the province should attract. Thus, this variable is expected to positively influence FDI inflows. GDP, as the proxy of market size, reflects a province's potential demand, and thus gives a good estimate of the province's market size. The larger the host region's GDP is, the greater the size of the potential market.

Foreign investors generally aim to take advantage of host countries' cheaper factor inputs. They display sensitivity to variations in labour costs in making their location decisions. This variable may be therefore related negatively to FDI inflows (Culem, 1988). However, if higher labour costs are related to higher labour quality (higher productivity) then higher wages might attract more FDI. Wang and Swain (1995) point out that nominal wage differences may not induce direct investment if labour productivity is very low. Countries or regions with low labour productivity may attract less FDI than those with high labour productivity together with relatively cheap labour, even if and when FDI is due to relocation to seek low labour costs. Therefore the empirical relationship between labour costs and FDI inflows is ambiguous.

The extent of a region's infrastructure development is important in an investor's location choice. This variable is expected to be positive related to FDI inflows. We use length of highways and railways as the proxies of infrastructure.

The labour supply in a host region influences investors' location decisions not only in terms of input costs, but also through the quality of the skills of the workers. The regions with highly skilled workers measured by educational levels, *ceteris paribus*, would be expected to compete more favourably in terms of FDI attractiveness. So this variable may have a positive effect on FDI inflows.

FDI inflows could also be dependent on the existing capital stock, particularly the existing FDI stock in the host region, because adding to existing stock in a particular location is perhaps less risky and less costly (Billington, 1999). Foreign firms face greater uncertainties than domestic firms in the host country. Therefore, they may have strong incentives to follow previous investors because of the signal they send as to the reliability of the host country location. In order to take account of the dynamic process of FDI inflow, one year-lagged FDI will be included as an explanatory variable, which is expected to be positive related to FDI inflows.

Agglomeration or clusters means groups of interconnected firms, suppliers, related industries, and specialised institutions in particular fields are present in particular locations (Porter, 1998). It was advanced by Alfred Marshall in the 1890s as the spatial externality concept and nowadays acts as a fundamental explanation of economic growth, productivity, and investment. Furthermore, the new growth theory also argued that knowledge spillovers among firms through externality and diffusion can reduce their costs (Griliches, 1979). Braunerhjelm and Svensson (1996) pointed out that if it is important for firms' competitiveness to gain knowledge spillovers and pecuniary externalities, agglomeration forces would increasingly influence firms'

locational decisions. Investment in the regions with substantial clustering of industrial activities is likely to involve relatively lower costs than in a region with a dispersed manufacturing sector. Furthermore, Porter (1998) argued that agglomeration forces (clusters) not only reduce transaction costs and boost efficiency but improve incentives and create collective assets in the form of information, specialised institutions, and reputation. More importantly, agglomeration forces enable innovation, speed productivity growth, and also ease the formation of new business. Hence, we introduce agglomeration effect as an explanatory variable into our estimate model. This variable is expected to be positively related to FDI inflows.

Head et al. (1995) estimated the location choices of 751 Japanese manufacturing plants built in the United States since 1980 and found that the geographical distribution of Japanese investments demonstrates the importance of agglomeration economies in their location decision. They also found that initial investments by Japanese firms spur subsequent investors in the same industry or industrial group to select the same states. This pattern of location choice supports an agglomeration-externalities theory of industry localisation rather than a theory based on inter-state differences in endowments of natural resources, labour, and infrastructure.

As noted above, geographical location of a province is an important determinant of the FDI distribution in China. It is expected that provinces located in the coastal region will attract more FDI because of their superior natural, social, and economic conditions. Also the coastal location is important in China because of the government preferential policies covering throughout the region by SEZs, open coastal cities,

economic and technological development zones, and special economic deltas. In order to take the two variables into account, a dummy variable combining geographical location and preferential policy (because they take the same values) will be added into the estimated model.

Finally a time dummy variable to test whether the Tiananmen incident of 1989 affected FDI inflows will also be included. We expect this variable to have a negative effect on FDI inflows. The estimation equation is of the following form:

$$FDI = f(FDI_{(-1)}, \text{Market size, Labour cost, Infrastructure, Human capital, Agglomeration, Dummy location/policy, Dummy89}) \quad (4.1)$$

The brief summary of the potential determinants of FDI in China and the proxies are listed in Table 4.5.

Table 4.5 The determinants of FDI in China

Determinant	Proxy	Expected sign
Inertia	One year-lagged FDI	+
Market size	GDP	+
Labour cost	Wage	?
Infrastructure	The ratio of length of highways/railways to the land area	+
Human capital	The ratio of education to population	+
Agglomeration	The ratio of the number in employment to the land area	+
Location and policy	The coastal region	+
Time dummy variable	The period 1989-91 for Tiananmen Incident aftermath	-

To test the model, a panel data set of pooled cross-section and time-series data at the province-level across the 29 provinces (autonomous regions and central

municipalities) is employed. Tibet is excluded because it attracted very little FDI throughout the period, just US$30,000 inflows in 1988. Chongqing became a central municipality out of Sicuan province in 1996. To maintain consistency, the data for Chongqing is included in Sicuan province after 1997 onwards. The time period considered is 15 years from 1985 to 1999. The data sources are various years of *China Statistical Yearbook* and *China Foreign Economic Statistical Yearbook.*

The dependent variable employed in the model is the actually used real FDI (at 1995 prices) in each province of China. Because data of real GDP (at 1995 prices) before 1989 is not available, it is interpolated from NI (National Income). The data for wages is the average annual wage of staff and workers (at 1995 prices). The data for highways and railways is the length of railways in operation and the total length of highways divided by the land areas. The data for education is the number of the student enrolment in Specialised Secondary Schools divided by the population[11]. Employment density should capture the extent of agglomeration economies and is obtained from employment divided by the land area. Due to the fact that it is very difficult to quantify the influence of the variables of geographical location/preferential policy and the Tiananmen Incident on FDI inflows, two dummy variables are used. For the location/policy dummy variable, all of the provinces and central municipalities in the coastal region take the value 1, while others take the value of 0. For the time dummy variable, the period 1989-1991 (after the Tiananmen Incident but before Deng's tour of south China) take the value 1, while others are 0.

[11] Some previous studies use the data of primary school, secondary school, or higher education enrolments, which we do not use because the level of education in specialised secondary school is the middle level in Chinese education system. Therefore it could be the best proxy of human capital.

In order to measure directly the impact of the explanatory variables on the dependent variable (FDI) in terms of elasticity, we use the log-linear model to change the equation (4.1) into logarithmic form:

$$LFDI_{it} = \alpha + \beta_0 LFDI_{it-1} + \beta_1 LGDP_{it} + \beta_2 LWAG_{it} + \beta_3 LRRW_{it} + \beta_4 LRHW_{it} + \beta_5 LRED_{it} + \beta 6 LAGGit + \beta_7 DTM + \beta_8 DLP + \varepsilon_{it} \quad (4.2)$$

Where L indicates logged values, i and t denote individual provinces and time, respectively, ε_{it} represents the error term. WAG = Wage, RRW = Railways, RHW = Highways, RED = Education, AGG = Agglomeration, DTM = Time dummy variable, DLP = Dummy variable for geographical location/preferential policy.

There are several advantages of adopting a log-linear functional form. One attractive feature of the log-linear model, which has made it popular in applied work as mentioned above, is that the slope coefficients measure the elasticity of the dependent variable with respect to the explanatory variables. That means the percentage change in the dependent variable for a percentage change in the explanatory variables, respectively. Another advantage of the log-linear functional form is its capability to transform a likely non-linear relationship between the dependent variable and the explanatory variables into a linear one. Finally, in the case of China, there are extreme values of FDI located in the regions in some years and also the coastal region is the dominant recipient of FDI among the three macro-regions in China (Wei and Liu, 2001).

As mentioned in Section 1.4 of Chapter 1, three statistical models are used to estimate a panel data set: pooled ordinary least squares (POLS), fixed effects (FES), and random effects (RES). In this chapter, only POLS model is used for estimation. Because the estimated equation (4.2) includes two dummy variables, the application of the FES model will cause a problem of perfect multicollinearity. The third model, RES is also not used because the number of parameters exceeded the number of cross-sections in the central and western region. In addition, both the FES and RES models can not be used here because equation (4.2) also includes the lagged dependent variable ($LFDI_{it-1}$) as an explanatory variable. If the equation includes the lagged dependent variable, as Greene (2003) pointed out, there is the difficulty in both the FES and RES models that the lagged dependent variable is correlated with the disturbance, even though it is assumed that ε_{it} is not itself autocorrelated.

4.5 Empirical Results

The empirical results obtained from the POLS model are summarised in Table 4.6 by the total country and the three macro-regions, coastal, central, and western region, respectively. A comparison of the empirical results from national level and three regions shows some interesting similarities and differences. The high values of adjusted R- squared, indicating that the explanatory variables in the model can explain most of the variation in the dependent variables, suggest that the explanatory variables are the proper major determinants of FDI regional location in China.

Table 4.6 Results for the total country and the three macro-regions 1985-1999

	Total country (1)	Coastal region (2)	Central region (3)	Western region (4)
C	0.5017	1.1648	5.8939	-6.9730
	(2.5285)	(2.9175)	(7.0115)	(8.1858)
$LFDI_{(-1)}$	0.7633	0.8207	0.5676	0.6796
	(0.0443)***	(0.0454)***	(0.1030)***	(0.0967)***
LGDP	0.2467	0.1225	0.9981	0.4781
	(0.0693)***	(0.0433)***	(0.2988)***	(0.3404)
LAGG	0.1324	0.0347	0.3656	0.1702
	(0.0605)**	(0.0880)	(0.3627)	(0.5991)
LRRW	-0.0447	-0.0707	0.0553	0.2045
	(0.0697)	(0.0584)	(0.3378)	(0.5732)
LRHW	0.0119	0.0659	-0.6500	-0.1531
	(0.0750)	(0.0607)	(0.6150)	(0.6173)
LRED	0.1102	0.0789	0.7954	-0.2003
	(0.1723)	(0.1949)	(0.3762)**	(0.6217)
LWAG	-0.0371	-0.0227	-0.2855	0.5042
	(0.2089)	(0.2431)	(0.5307)	(0.7774)
DTM	-0.5229	-0.2261	-0.6669	-0.8479
	(0.1255)***	(0.0987)**	(0.2559)**	(0.3055)***
DLP	0.3345			
	(0.0934)***			
$\overline{R}^2$	0.9006	0.9256	0.8225	0.8250

Notes: 1. Standard errors are in parentheses.
2. *** , ** and * indicate that the coefficient is significant at the 1%, 5% and 10% levels, respectively.
3. Number of observations is 383 for the total country, 163 for the coastal region, 124 for the central region, and 96 for the western region.

As can be seen from Column (1) of Table 4.6, when equation 4.2 is estimated for the total country, all the explanatory variables have the expected signs except the variable of railways (LRRW), which is statistically insignificant. The variables of previous FDI (LFDI $_{(-1)}$), market size (LGDP), geographical location/preferential policy (DLP), and Tiananmen Incident (DTM) are statistically significant at 1% level and agglomeration (LAGG) is statistically significant at 5% level, while other variables are insignificant.

LFDI $_{(-1)}$ appears to have the strongest positive influence on current inflows of FDI. A 1% increase in FDI $_{(-1)}$ would raise current FDI by 0.76%. This result suggests a self-reinforcing effect of FDI on itself, which is consistent with the results obtained by Cheng and Kwan (2000) using a different estimation methodology but contrary to the results estimated by Sun et al (2002).

The coefficient on market size (LGDP) indicates that market size is another very important variable. A 1% increase in GDP leads to a 0.25% increase in FDI. As stated in the section 3.4 of Chapter 3, one of the important motives of FDI in China is market seeking to take advantage of the vast Chinese domestic market for their products.

The agglomeration effect (LAGG) measured in terms of the ratio of the numbers in employment to the land area, is also an important consideration in FDI location within China. The interpretation of this result is that both the size and the depth of industrial and economic activity are important determinants of subsequent FDI inflows, which is consistent with the results identified by Head and Ries (1996).

The significant coefficients of the two dummy variables capturing the effects of geographical location/preferential policy and Tiananmen incident reveal that FDI firms did respond positively to the policy incentive, but negatively to Tiananmen incident. Also the regions having closer proximity to the coast will attract more FDI.

Human capital (LED) appears to be a positive factor as expected but insignificant. Cheng and Kwan (2000) also obtained similar results showing that the positive effect of the variables is not statistically significant. It is possible that because FDI in China concentrates on the labour-intensive industries in which the level of employee education is not important.

The variable of labour cost representing the wage level (LWAG) is negative for the total country of China, though it is insignificant. In fact, wage rates do not vary among regions in China as much as they do among other countries because of China's legacy of central planning, although the wage level in the coastal region has been rising quickly since the beginning of the 90s.

Finally, the infrastructure variables in term of railways and highways show the opposite signs. The former is negative while the latter has a positive effect on FDI inflows. These results may suggest that FDI firms prefer or are sensitive to highway accessibility but not to railways in general. This probably reflects a general shift of transport mode in China. In fact, the railway network had been built before the economic reform in China and industry used to rely on industrial railway terminals. Infrastructure development particularly the highway network was largely under-invested. The development of inter-city highways and city ring roads has been accelerated since the economic reforms, and particularly by the introduction of foreign investment (Wu, 2000). The highway network has been set up broadly especially in the coastal region of China because of its natural, social, geographical, and economic development factors as we mentioned previously. Thus, industry

activities mainly rely on highways rather than railways in the coastal region while in the central and western regions, it still relies on the old railways system because of the particular topographical features as mentioned above.

The results from Column (2) of Table 4.6, for the coastal region, show some similarities and differences from Column (1). LFDI $_{(-1)}$, LGDP, and DLP are still significant also with correct signs. But LAGG is no longer significant, which may possibly imply that FDI firms are more concerned with national agglomeration rather than regional agglomeration. LWAG is still negative and insignificant, which indicates that FDI inflows are not sensitive to changes in labour costs in the coastal region, though the wage level in this region has been rising quickly since the beginning of the 90s. In fact, the present wage level in the coastal region is still much lower than the developed countries, even most of the developing countries. Therefore, this variable is not important to FDI firms when they decide to locate in China.

The evidence from Column (3), the central region, implies that LGDP is the most important variable in this area. A 1% LGDP increase would result in approximately 1% increase in FDI inflows. This suggests that the main type of FDI in the central region of China is market-seeking FDI, which is motivated by China's vast inland market. In contrast, from Column (4) it appears that LGDP is insignificant. Also LRHW, LRED, and LWAG have the wrong signs. It is possible to suggest that FDI in the western region is mainly for extraction and exploitation of the abundance of minerals and energy resources. Therefore, FDI might be allocated there regardless of the market size, the absence of the highway network, educated work force or high

wages. A comparison of the coefficients of DTM in the three macro-regions shows that the aftermath caused by Tiananmen Incident is even worse in the western region, which leads to 0.85% decrease in FDI inflows.

A comparison of the results from the total country of China and the three macro-regions confirms that the locational characteristics are taken into account at the most appropriate geographical level (Billington, 1999). We can find the evidence from Table 4.6, for example, that LAGG is significant at the national level but not at the regional level, which could suggest that agglomeration is more important at national level rather than regional level to foreign investors in China.

It should be noted that the wage level could be correlated with the education level, and the length of railway and highway could also be correlated. Calculations of the correlation coefficient (0.324 between wage and education and 0.329 between railway and highway, respectively), show that there is no perfect multicollinearity in the estimation equation. Also, after all insignificant variables are eliminated from the equations, the regression results from the new equation are similar to the original ones (see Table 4.7).

Table 4.7 Results from the new equation

	Total country (1)	Coastal region (2)	Central region (3)	Western region (4)
C	-0.3573	0.7866	-0.8708	0.9251
	(0.3132)	(0.2364)***	(2.2132)	(0.3620)**
$LFDI_{(-1)}$	0.7842	0.8416	0.5672	0.8768
	(0.0336)***	(0.0239)***	(0.0972)***	(0.0562)***
LGDP	0.2115	0.1140	0.9747	
	(0.0550)***	(0.0341)***	(0.2547)***	
LAGG	0.1110			
	(0.0571)*			
LRED			0.5270	
			(0.2935)*	
DTM	-0.5220	-0.2273	-0.6642	-0.6704
	(0.1237)***	(0.0957)**	(0.2423)***	(0.2889)**
DLP	0.3486			
	(0.0892)***			
$\overline{R}^2$	0.9010	0.9273	0.8265	0.8121

Notes: 1. Standard errors are in parentheses.
2. ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% levels, respectively.
3. Number of observations is 383 for the total country, 163 for the coastal region, 124 for the central region, and 96 for the western region.

4.6 Conclusions and Policy Implications

The purpose of this chapter was to assess the regional location determinants of FDI in China at national and regional levels and try to explain the causes leading to the phenomenon of the skewed spatial pattern of FDI in China. An empirical estimation has been implemented extending previous studies with a longer and more recent data set and different methodologies. We use panel data at province-level across the 29 provinces over the period 1985-1999 in China.

The empirical results suggest that previous inflows of FDI, the size of the markets, the preferential policies, and the geographical proximity location variables exercise important positive influences upon current inflows of FDI in China at both national and regional levels. The agglomeration effect is significant and positively associated with FDI inflows at national level but not significant at regional level. Human capital appears to be positive and significant in the central region, while it is positive but not significant in the total country of China, the coastal and western regions. The labour cost variable is negative and insignificant at both national and regional levels except it is positive in the western region. The infrastructure variables do not appear to be significant in any case. Also they have mixed signs across the different levels and regions. The Tiananmen incident has the expected negative sign and is significant in all regions of China.

The empirical results also reveal the reasons which caused the skewed spatial pattern of FDI in China. The coastal region attracted 88% of total actually used FDI in China because of the preferential policies, superiority in industrial and economic development, and the historical and geographical proximity to Hong Kong, Macao, and Taiwan.

Further widening of regional disparities could cause conflicts between nationalities and may lead to even larger social and political problems. Therefore, the Chinese government should regard regional disparities as one of the major national policy issues and make efforts to slow them down and eventually to reduce them. In fact, the Ninth Five-year Plan (1996-2000) of China has given attention to reduce regional

disparity. As stated in Section 3.2 of Chapter 3, the Chinese government offers preferential policies to some of the inland cities that are the same as to the "open cities" in the coastal region. At the same time, it phased out preferential policies provided to foreign investment in SEZs and Pudong. According to the Tenth Five-year Plan (2001-2005), the dominant task is to develop the western region of China. The Chinese government should improve the investment environment, encourage domestic and foreign investments into the area by further offering special preferential policies. Even more important, it should maintain the country stability and policy steady. As a result, more FDI will be expected to flow into the inland regions.

Also the inland regions, compared with the coastal region, have their own special advantages such as much cheaper inputs of production in term of land, labour and material and more abundant natural resources. Moreover, as mentioned above, the "Third Front" construction in 60s built up the important industrial base such as many key enterprises and research institutes. This will be also expected to help, and with more FDI inflows should further reduce the uneven economic development across China.

Given the uneven locational pattern of FDI, Chapter 5 and Chapter 6 will investigate whether and how FDI has affected China's competitiveness from a macroeconomic perspective in terms of national economic growth and export performance, respectively.

CHAPTER 5

THE IMPACT OF FDI ON CHINA'S ECONOMIC GROWTH

5.1 Introduction

The market-oriented economic reforms and 'opening up' policy pursued by the Chinese government since 1978 have resulted in high economic growth and a remarkable transformation in economic structure. During the 1978-99 period, the Chinese economy has grown at an annual average rate of 9.58 percent[12], ranking China among the fastest growing economies in the world.

At the same time, the growth of foreign direct investment (FDI) in China has also been dramatic. During the 1984-99 period, the annual average rate of FDI inflows is at 26 percent. By the end of 1999, the total number of FDI projects in China reached 341,062, with a total actually used amount of US$ 305.92 billion (see Chapter 3). With increasing inflows of FDI into China, the issue of the effect of FDI on China's competitiveness in terms of economic growth is becoming increasingly important.

As an important dimension of the macroeconomic impact of FDI on the host economy, FDI can affect the host country's economic growth in various ways. FDI might increase the stock of real capital and might be a major channel for advanced

[12] The credibility of China's statistics on economic growth has been an issue of concern for years. A number of studies concluded that growth statistics have significant errors, some even provide revision of the economic growth rate (Rawski, 2001; Wang and Meng, 2001; Maddison, 1998). Meanwhile, the Chinese government insists its figures for GDP growth are reliable (The Economist, March 16th 2002; Financial Times, February 28th 2002).

technology to spread from developed countries to developing countries (Balasubramanyam, et al. 1996; Borensztein et al. 1998). The host countries could benefit from technology spillovers, access to productive capacity, advanced technology, better management resources, and production networks that enhance the marginal productivity of the capital stock in the host countries and increase real output, further promoting economic growth (Wang and Blomstrom, 1992). Through knowledge transfer, FDI might augment the existing stock of knowledge in the host countries through labour training, skill acquisition and the introduction of alternative management practises and organisational arrangements (de Mello, 1999). FDI also could be an agent for the transformation of the host countries (Lloyd, 1996) in the sense that multinational firms have played a central role in the host developing countries' production capacities which are often directed towards export-oriented activities. As a result, FDI contributes to the transformation of the industrial structure of the host economies and the commodity composition of their exports. Moreover, FDI might raise employment by either creating new jobs directly or using local inputs, which creates additional jobs indirectly.

However, FDI could also adversely influence economic output. If FDI results in a non-competitive market structure, then industrial concentration might increase and the degree of competition in the long-run might be seriously impaired, even though competition might be enhanced in the short-run (Karikari, 1992). FDI might lower domestic investment and lead to shrinking of indigenous industries. FDI might reduce the host country's welfare when multinational firms manipulate market power and transfer pricing. FDI might create enclave economies in the host country, widening

the income gap, and biasing the host economy toward an inappropriate technology and product mix (Zhang, 2001).

This chapter aims to investigate whether and how FDI affects China's competitiveness in terms of economic growth. The rest of the chapter is organised as follows. Section 5.2 introduces the growth of FDI and GDP in China. Section 5.3 reviews selected literature on the relationship between FDI and economic growth. In section 5.4 the empirical analysis using an extended production function is discussed. Section 5.5 presents the main empirical results while the last section summarises the key conclusions and policy implications.

5.2 The Growth of FDI and GDP in China

As stated in Chapter 3, the growth of FDI in China can be distinguished into three different phases. The first phase 1979-1983, is a period of sluggish increase. In the second phase of 1984-1991, the inflows of FDI show an increasing trend. Since 1992 in the third phase, the large-scale expansion of FDI has made China (after 1993) the largest recipient of FDI among the developing countries and the second largest in the world after the United States. Meanwhile, China's average annual growth rate of GDP is 9.58 percent over the period of 1978-1999, 8.1 percent in 1985-1991 and 12.7 percent in 1992-1999 with 4.6 percentage points higher than the last period. The patterns of growth of FDI and GDP strongly suggest a correlation between the two variables.

Table 5.1 shows data for FDI, GDP and the ratio of FDI to GDP in China 1985-1999. The data in column (1) and (3) are from *China Statistical Yearbook 2000.* The data in column (2) are derived from column (1), where the period average exchange rates were used to convert US dollars into RMB yuan. In 1985, FDI in China was only US$1,661 millions (4,880 millions RMB yuan) whereas GDP was 896,440 millions RMB yuan. The ratio of FDI to GDP was only 0.54 percent. During the time period of 1985-1999, both FDI and GDP expanded dramatically, reaching US$40,319 millions (333,830 millions RMB yuan) of FDI, 8191,090 millions RMB yuan of GDP. The ratio of FDI to GDP was more than 4 percent in 1999.

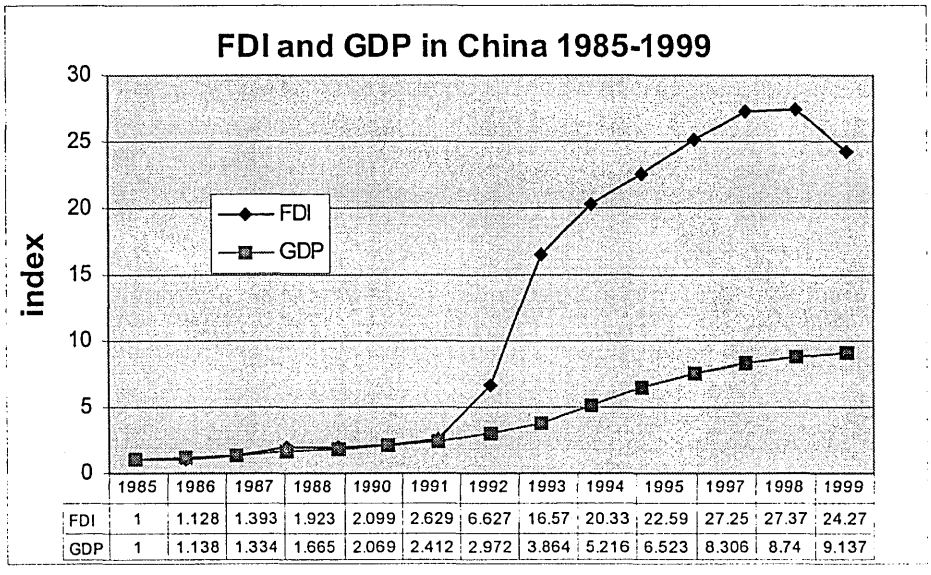
Table 5.1 FDI and GDP in China 1985-1999

	FDI (US$) 100 million (1)	FDI (RMB) 100 million (2)	GDP(RMB) 100 million (3)	FDI/GDP (%) (4)=(2)/(3)
1985	16.61	48.8	8964.4	0.54
1986	18.74	64.7	10202.2	0.63
1987	23.14	86.1	11962.5	0.72
1988	31.94	118.9	14928.3	0.8
1989	33.92	127.7	16909.2	0.76
1990	34.87	166.8	18547.9	0.9
1991	43.66	232.4	21617.8	1.07
1992	110.07	607	26638.1	2.28
1993	275.15	1585.4	34634.4	4.58
1994	337.67	2910.3	46759.4	6.22
1995	375.21	3133.3	58478.1	5.36
1996	417.25	3469.1	67884.6	5.11
1997	452.57	3751.7	74462.6	5.04
1998	454.63	3763.9	78345.2	4.8
1999	403.19	3338.3	81910.9	4.08

Source: Column (1) and (3) are from *China Statistical Yearbook 2000,* Column (2) and (4) are from computed by the author.

Figure 5.1 shows indices for FDI and GDP in China, derived from Table 5.1 and using 1985 as the base year. We can see clearly the growth trends of FDI and GDP in China during 1985-1999. Before 1991, the growth indices of FDI and GDP are almost

same with the two curves overlapping. Since 1992, FDI inflows into China increased dramatically, the indices of FDI in 1997 and 1998 are the highest during this period with more than 27 times the amount of FDI in 1985. At the same time, the growth of GDP was dramatic as well with more than 8 times of GDP in 1985 since 1997.



	1985	1986	1987	1988	1990	1991	1992	1993	1994	1995	1997	1998	1999
FDI	1	1.128	1.393	1.923	2.099	2.629	6.627	16.57	20.33	22.59	27.25	27.37	24.27
GDP	1	1.138	1.334	1.665	2.069	2.412	2.972	3.864	5.216	6.523	8.306	8.74	9.137

Source: calculated by the author.

Figure 5.1 FDI and GDP in China 1985-1999

Table 5.2 shows that during 1985-1999, the percentage of total GDP attributed to the coastal, central, and western regions was 58%, 28%, and 14%, respectively. As discussed in Chapter 4, with increasing inflows of FDI into China, the geographical distribution of the cumulative FDI in China is significantly characterised by its high concentration in the coastal region. During the period of 1985-1999, about 88 percent of FDI flowed into the coastal region, only 9 percent were located in the central region and 3 percent in the vast western region. There are a few reasons causing the uneven spatial development of FDI in China. First, the preferential policies offered by

Chinese government to the coastal region for attracting FDI inflows. Second, the coastal region has a larger size of market, better infrastructure, more human capital and thereby superior to the central and western regions. Third, 'special factors' in the coastal region such as the close geographical proximity, pre-existing kinship, social network and tight culture affinity. Similarly, the distribution of domestic investment in the three macro-regions is 63% in the coastal region, 23% in the central region, and 14% in the western region (see Table 5.2). The spatial pattern of domestic investment is similar to the pattern of FDI in China.

Table 5.2 Actually used FDI, DI and GDP by three regions in China 1985-1999

	FDI (US$10,000)		DI (RMB million yuan)		GDP (RMB million yuan)	
Coastal	26,005,322	88	11,538,088	63	33,146,050	58
Central	2,661,927	9	4,282,660	23	16,145,140	28
Western	945,021	3	2,598,247	14	8,342,265	14
Total	29,612,270	100	18,418,995	100	57,633,460	100

Source: China State Statistical Bureau, computed by the author

This kind of uneven spatial pattern has raised interesting and essential questions about whether and how FDI and domestic investment affect China's GDP growth in different regions. In this chapter, we use the same methodology as the last chapter. China is divided into the three macro-regions and the empirical results will be reported at national level as the total country of China and regional level as the coastal region, central region, and western region, respectively.

5.3 Literature Review

A number of empirical studies on the relationship between FDI and economic growth have been conducted for developing countries (Karikari, 1992; Balasubramanyam, et al. 1996; Khan and Leng, 1997; Borensztein, et al. 1998; de Soysa and Oneal, 1999; Zhang, 1999; Nair-Reichert and Weinhold, 2001). Some research has been done for both developed and developing countries (for example, Olofsdotter, 1998; de Mello, 1999). Table 5.3 shows the summary of previous studies on the FDI-economic growth relationship by main aspects.

There is conflicting empirical evidence in the literature regarding the impact of FDI on economic growth. Most of the studies show a positive relationship whereas some show conditional empirical results.

Table 5.3 Summary of previous studies on FDI – economic growth

Studies	Countries	Data/Econometric technique	Results
Karikari (1992)	Ghana	Annual data (1961-88) Granger causality test	FDI did not affect economic output while increases in economic output cause a small reduction in the inflow of FDI
Balasubramanyam, et al. (1996)	Forty-six developing countries	Cross-section, annual average (1970-85) OLS	FDI enhanced economic growth is stronger in export promoting countries than in import substituting countries
Khan and Leng (1997)	Korea, Singapore, and Taiwan	Annual data (1965-95) DF and ADF tests Cointegration test Granger causality test	A general lack of causation in relationship of FDI-exports-GDP
Borensztein, et al. (1998)	Sixty-nine developing countries	Panel data (1970-89) SUR	FDI contributes to economic growth only when a sufficient absorptive capability is available in the host country.
de Soysa and Oneal (1999)	114 countries including 97 LDCs	Annual average data (1980-91)	No evidence that FDI harms the economic prospects of developing countries.
Zhang (1999)	Ten East Asian countries	Annual data Unit-root test Cointegration test Causality test	Mixed evidence
Nair-Reichert and Weinhold (2001)	24 developing countries	Panel data (1971-95) Holtz-Eakin causality test MFR causality test	Mixed evidence
Olofsdotter (1998)	50 countries (developed and developing countries)	Annual data (1980-90) OLS	FDI leads to higher growth rates by bringing new technology to the host country
de Mello (1999)	OECD and non-OECD countries	Time-series and panel data (1970-90) ADF test Cointegration test FES	FDI is growth-enhancing depends on the degree of complementarity and substitution between FDI and domestic investment

(Table 5.3 continued)

Sun and Chai (1998)	China	Panel data (1986-1992) GLS	The effect of FDI on economic growth was stronger in the eastern region and very weak in the western region, which reinforced the inter-regional economic inequality.
Sun (1998)	China	Panel data (1979-1996) Kmenta model	Domestic investment is the main determinant of China's economic growth. FDI and labour force play important roles in the remarkable economic growth as well.
Berthelemy and Demurger (2000)	China	Panel data (1985-1996) Endogenous growth model	The transfer of foreign technology by FDI is a key determinant of economic growth; exports and domestic investment have an insignificant role in China's economic growth process.
Zhang (2001)	China	Cross-section and panel data (1986-1997) FES	FDI had a positive impact on China's economic performance, the effect was larger in 1992-1997 than in 1986-1991 and numerically much larger in the coastal region than in the western region. Also the effect of FDI is much larger than that of domestic investment.
Buckley et al. (2002)	China	Panel data (1989-1999) OLS	The host country conditions impact strongly on the growth relationship at both the national and provincial levels and FDI favours growth in the economically stronger provinces.

Karikari (1992) examined causality between FDI and economic growth in Ghana during the period of 1961-1988. His results show that FDI did not affect economic output, while increases in economic output caused a slight decrease in the inflows of FDI.

Balasubramanyam, et al. (1996) investigated the role that FDI plays in the growth process in the context of 46 developing countries characterised by different trade policy regimes with cross-section annual data over the period 1970-1985. They found FDI is more productive for economic growth in the export promoting (EP) countries than in the import substituting (IS) countries.

Borensztein, et al. (1998) tested the effect of FDI on economic growth in 69 developing countries over the last two decades by using a cross-country regression framework. They argued that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. However, they further argue that the higher productivity of FDI holds only when the host country has a minimum threshold stock of human capital. Thus FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host country.

In the context of China, there has been a growing study on the role of FDI in the Chinese economy, such as Sun and Chai (1998); Sun (1998); Berthelemy and Demurger (2000); Zhang (2001); and Buckley et al. (2002).

Sun and Chai (1998) completed a regression analysis on the effects of FDI on economic growth in the eastern and western regions of China by using panel data across 16 provinces over the period of 1986-1992. They pointed out that economic structure and resource conditions, economic reforms and open-door policy with emphasis on the eastern region led to the phenomenon of the skewed spatial pattern

between the eastern and western regions in economic growth. As a result, both FDI and domestic investment had different growth rates in the two regions furthering the economic disparities. Their results indicate the effect of FDI on economic growth was stronger in the eastern region and very weak in the western region which reinforced the inter-regional economic inequality.

In another study, Sun (1998) investigated macroeconomic impact of FDI in China during 1979 to 1996. He found that domestic investment is the main determinant of China's economic growth. Meanwhile, FDI and labour force play important roles in the remarkable economic growth as well.

Berthelemy and Demurger (2000) investigated the relationship between FDI and economic growth in China across 24 provinces over the period 1985-1996, using an endogenous growth model. They argued that the transfer of foreign technology by FDI is a key determinant of economic growth and confirmed the fundamental role played by foreign investment in provincial economic growth in China. They found exports and domestic production factors to have an insignificant role in the economic growth process.

Similar empirical results have been obtained by Zhang (2001) by using cross-section and panel data for 28 provinces over the period of 1986-1997. The results show FDI generally had a positive impact on China's economic performance. However, the effect was larger in 1992-97 than in 1986-91 and numerically much larger in the coastal region than in the inland region. Also, the effect of FDI on

China's economic performance is numerically much larger than that of domestic investment.

Buckley et al. (2002) investigated for China the proposition that the host country's economic and technological conditions modify the relationship between FDI and growth by using panel data across 29 provinces over the period 1989-1999. They find that host country conditions impact strongly on the growth relationship at both the national and the provincial levels. They also argue that FDI favours growth in the economically stronger provinces and market reform is a very successful general policy to increase growth in a wide range of circumstances.

Based on previous studies, this chapter aims to provide a further investigation to estimate the role of FDI on economic growth in China by using a richer panel data set at the province-level across the 29 provinces over the period 1985-1999.

5.4 Model, Data and Methodology

Growth theory can be categorised into three broad groups. First, the early post-Keynesian growth models which emphasised the role of saving and investment in promoting growth. Second, the neo-classical models, which emphasised technical process. Finally, the more recent new endogenous growth models which emphasise the role of R&D, human capital accumulation and externalities.

Early development economists such as Rosenstein-Rodan (1943, 1961), Nurkse (1953) and Lewis (1954) emphasised the role of capital accumulation in growth. Given a constant capital-output ratio, the Harrod-Domar model (Harrod 1939, Domar 1947) predicted that the higher the saving rate, the higher the rate of growth. However, since capital accumulation was regarded as central to growth, the assumption of a constant capital-output ratio was considered unrealistic, in which the phenomenon of diminishing returns could soon be expected to reduce and finally eliminate all per capita income growth. Based on such models, which emphasise capital accumulation, it is difficult to foresee how growth can continue beyond a few decades given the assumption of diminishing returns.

Neo-classical growth theory (Abramovitz, 1956; Solow, 1956 and 1957) regards growth largely as the outcome of exogenous technical progress which effectively offsets the law of diminishing returns to which inputs are subject. However, in neo-classical growth models, the effect of FDI on output is limited by diminishing returns to physical capital in long-run. Long-run growth can only result from technological progress and/or population (labour force) growth, which are both considered to be exogenous. FDI would only affect output growth in the short-run, leaving the long-run growth rate unchanged.

The new endogenous growth models (Romer, 1986, 1987; Lucas, 1988; Krugman, 1990; Murphy et al. 1989a, 1989b; Shaw, 1992; and Aghion and Howitt, 1998) consider long-run growth to be a function of technological progress and provide a framework in which FDI can permanently increase the rate of growth in the host

economy through externalities, technology, transfer, diffusion, and spillover effects. FDI is also expected to be a very important source of human capital augmentation and technological change in developing economies since it promotes the use of more advanced technologies by domestic firms and provides specific productivity-increasing labour training and skill acquisition. New growth theory provides powerful support for FDI as a potent factor in promoting economic growth in host countries especially in the developing countries (Balasubramanyam, et al. 1996; de Mello, 1997; Wu, Y. 2000; Nair-Reichert and Weinhold, 2001).

Following new growth theory, we model GDP by means of an extended Cobb-Douglas production-function model where FDI is treated as an additional production input along with labour and (domestic) capital. Capital is then divided into a fixed physical capital stock and human capital. Therefore, GDP used as the proxy of economic output can be expressed as a function of labour, domestic investment, FDI, and human capital.

$$GDP = f(\text{Labour, Domestic investment, FDI, Human capital}) \qquad (5.1)$$

We expect that every explanatory variable will positively influence GDP. Labour force data is the number of staff and workers. FDI data is the actually used FDI. As FDI is reported in US dollars while GDP and domestic investment are reported in RMB yuan, the period average exchange rates were used to convert FDI into RMB yuan. The data for domestic investment is total investment in fixed assets. The data for human capital is the number of the students enrolled in specialised secondary

schools as explained in the last chapter. The brief summary of the potential explanatory variables and their proxies are listed in Table 5.4.

Table 5.4 The potential explanatory variables

Variable	Proxy	Sign
Labour	The number of staff and workers	+
Domestic investment	Total investment in fixed assets	+
FDI	Actually used FDI	+
Human capital	The number of the students enrolled in specialised secondary schools	+

Some previous studies conduct traditional causality tests[13] by using a simple bivariate model with single time series or cross-section data. This is not enough to investigate the effects of FDI on economic growth from a broader economic perspective. First, the approach of using a simple bivariate framework in the causality test without considering the effects of other variables (such as labour, domestic capital, human capital) is subject to a possible specification bias. Second, cross-section studies may erroneously assume a common economic structure and similar production technologies across different sectors. Also economic growth of a country is influenced not only by FDI and other factor inputs as mentioned above, but also by different policies during different periods. Therefore, the significance of the conclusions drawn from cross-section data is not sufficient in finding a long-run causal relationship (Shan, et al. 1999). Third, causality tests are not suitable to deal with annual time series data in a short time period at the national level to test the effects of FDI on other macroeconomic variables such as economic growth (Sun, 1998).

[13] The concept of causality is defined by Granger (1969), meaning that a variable x is said to "Granger cause" a variable y. It enables better predictions for y if the past values of x are taken into account.

This empirical analysis is based on a panel data, which cover 29 provinces (autonomous regions and central municipalities) and the time period considered is 15 years from 1985 to 1999. The data are from various issues of *China Statistical Yearbook, China Foreign Economic Statistical Yearbook* and *Almanac of China's Foreign Economic Relations and Trade.* As explained in Chapter 4, Tibet is excluded, and the data for Chongqing and Sicuan province are combined from 1997 onwards.

Due to the fact that the two explanatory variables of FDI and domestic investment in the model (5.1) are flows while the others are stock variables, we change all variables into ratios or growth rates for consistency purposes. Moreover, there are several advantages for using relative values as Nair-Reichert and Weinhold (2001) argued. First, the use of relative values such as growth rates can determine the relationship between the variables over time in a particular region. Second, by using relative values of the variables it is likely that the variables will be stationary and avoid the problem of spurious regressions.

It should be noted that there is the possibility of a bidirectional relationship between economic growth and FDI inflows. The direction of causation may run either way, from growth to FDI because FDI may be drawn to the regions with faster growth or greater potential growth prospects, which make the regions more attractive to foreign investors. To estimate the possible causality relationships, we use a Granger-causality test. The results indicate that there is a one way relationship from FDI to GDP. FDI Granger causes growth while growth Granger does not cause FDI, which is consistent with the results obtained by Buckley et al. (2002). In addition, a log-linear

function form of (5.1) is adopted due to the similar reasons discussed in the last chapter. Thus equation (5.1) can be rewritten in the following form:

$$LGGDP_{it} = \beta_1 LGLA_{it} + \beta_2 LRDI_{it} + \beta_3 LRFDI + \beta_4 LGHC_{it} + v_{it} \qquad (5.2)$$

where L indicates logged values, v is a composite term including both intercept and the stochastic error term, i and t denote individual provinces and time, respectively. GGDP is the growth rate of GDP, GLA is the growth rate of labour, RDI is the ratio of domestic investment to GDP, RFDI is the ratio of FDI to GDP, GHC is the growth rate of human capital.

As discussed in Chapter 1, a panel data set can be estimated in any of three ways, pooled ordinary least squares (POLS), fixed effects (FES), and random effects (RES), depending on whether the individual cross-section effects are considered to be constant, fixed or random. The three statistical models differ mainly in the assumptions concerning v_{it}, which can be decomposed into two terms:

$$v_{it} = u_i + \varepsilon_{it} \qquad (5.3)$$

where u_i is time-invariant and accounts for any unobservable individual-specific effects not included in the regression while ε_{it} is the remainder disturbance. In the POLS model, the u_i s are treated as an intercept which is held constant across the individual cross-section units. The FES model allows the u_i s to vary between units and treats them as parameters to be estimated. In other words, dummy variables are employed to capture the unobserved heterogeneity. In the RES model, the u_i s are

assumed to be a random variable that is independent and identically distributed, i.e. $u_i \sim IID\ (0,\ \sigma_u^2)$. All of the three models assume that ε_{it} varies with individuals and time. It can be thought of as the usual disturbance in the regression and is assumed to be normally distributed with a mean of zero and constant variance.

Because these three models have their own advantages and disadvantages (see Section 1.4 Chapter 1), we apply the three tests, LR, LM, and HS tests, to determine the appropriate model. We use a LR test for the FES model against the POLS model. The LR test statistic, under the null hypothesis of constant individual-specific effects is:

$$LR = NT * \log(1 + \frac{RSS_r - RSS_u}{RSS_u}) \sim \chi^2\ (N\text{-}1) \qquad (5.4)$$

where RSS_r and RSS_u represent the residual sums of squares in the POLS and FES models respectively. The LR statistic is asymptotically distributed as χ^2 (N-1). A large value of the LR statistic argues in favour of the FES model over the POLS model.

The LM test, for choosing between the POLS and RES models, identifies the existence of heterogeneity with the null hypothesis $\sigma_u^2 = 0$:

$$LM = \frac{NT}{2(T-1)}\left[1 - \frac{\varepsilon'(I_N \otimes J_T)\varepsilon}{\varepsilon'\varepsilon}\right]^2 \qquad (5.5)$$

where the statistic LM is asymptotically distributed as χ^2 (1), ε is the vector of residuals, I_N is an identity matrix of dimension N, J_T is a matrix of ones of dimension T, and $\otimes$ is the Kronecker product. Under the null hypothesis of no heterogeneity, a

large value of the test statistic favours the RES model against the POLS model.

To choose between the FES and RES models, the HS test is used to test the hypothesis that u_i and the regressors are uncorrelated. Under the null hypothesis that the RES model is the correct specification, the HS test is based on the Wald criterion:

$$HS = [b_{fe} - b_{re}]' Var\ [b_{fe} - b_{re}]^{-1} [b_{fe} - b_{re}] \sim \chi^2 (k) \qquad (5.6)$$

where b_{fe} and b_{re} are estimators of the regressors in the FES and RES models, respectively, k is the number of regressors and Var is the variance-covariance matrix. The HS statistic is asymptotically distributed as χ^2 (k). A large value of the HS test statistic favours the FES model over the RES model.

5.5 Empirical Results

The empirical results obtained from the POLS model, the FES model, and the RES model are presented in the four tables below for the total country (see Table 5.5), the coastal region (see Table 5.6), the central region (see Table 5.7), and the western region (see Table 5.8), respectively. A comparison of the empirical results from the national and regional levels show some interesting similarities and differences.

Table 5.5 Results of panel data estimations for the total country, 1985-1999

	POLS	FES	RES	Tests
C	-0.4657		0.2071	
	(0.2044) **		(0.2684)	LR:
LRDI	0.0808	0.2180	0.1758	$\chi^2(28)= 51.32$***
	(0.1367)	(0.1921)	(0.1810)	
LRFDI(-1)[14]	0.0878	0.1845	0.1575	
	(0.0203) ***	(0.0235) ***	(0.0225) ***	LM:
LGHC	0.1317	0.1552	0.1507	$\chi^2(1)= 0.36$
	(0.0468) ***	(0.0693) ***	(0.0479) ***	
LGLA	0.0881	0.1240	0.1137	
	(0.0167) ***	(0.0156) ***	(0.0198) ***	HS:
				$\chi^2(4)= 25.81$***
$\overline{R}^2$	0.1918	0.2960	0.3459	

Notes: 1. Standard errors are in parentheses.
2. ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% level, respectively.
3. Number of observations is 229.

In Table 5.5, the results from the three different models show many similarities. As discussed above, a large value of the LR statistic argues in favour of the FES model over the POLS model. A large value of the LM statistic argues in favour of the RES model against the POLS model. Again a large value of the HS test statistic favours the FES model over the RES model. Therefore, the FES model is the best model in this case. We only report the results from the FES model.

The results from the FES model show that all of the explanatory variables have a positive influence as expected on the country's economic growth at a high statistically significant 1% level except LRDI which is statistically insignificant. The coefficients on LRFDI $_{(-1)}$, LGHC and LGLA reveal that the three factors have similar power to

[14] In order to take account of the dynamic effect process of FDI on economic output, a one year lagged LRFDI is employed in the estimation equation (5.2). We also regressed the equations with a one year lagged LRDI, the results obtained are similar to the tables shown in the text.

drive China's economic growth at the national level. LRFDI $_{(-1)}$ appears to have the strongest influence on LGGDP, a 1% increase in LRFDI $_{(-1)}$ would raise LGGDP by 0.18%, while a 1% increase in LGHC and LGLA would raise LGGDP by 0.16% and 0.12%, respectively. LRDI is positive but insignificant, which is consistent with the result obtained by some previous studies (Borensztein, et al. 1998; Sun and Chai, 1998; de Soysa and Oneal, 1999; Berthelemy and Demurger, 2000; Zhang, 2001) except Sun (1998).

According to Berthelemy and Demurger (2000), about 62 percent of total fixed capital investment went to China's state-owned enterprise during 1985 to 1996. Domestic investment is inefficiently allocated in China's state-owned enterprises over time. Meanwhile, there are many crucial problems existing in China's state-owned enterprises, such as severe over-capacity and overmanning, low productivity and inefficiency, lack of product scale and scope, outdated industrial structure.

This result is also consistent with the predictions of the FDI theories that foreign capital should be more powerful than domestic capital in explaining growth. In other words, marginal product of foreign capital should be greater than that of domestic capital. In summary, China's economy is at the stage at which the country's growth has been mainly driven by the expansion of FDI and the stocks of the labour force and human capital, rather than by domestic investment.

Table 5.6 Results of panel data estimations for the Coastal Region, 1985-1999

	POLS	FES	RES	Tests
C	0.1317		0.5823	
	(0.3558)		(0.3819)	LR:
LRDI	-0.1159	0.2624	0.1077	$\chi^2(11)= 21.22$**
	(0.2299)	(0.2885)	(0.2850)	
LRFDI(-1)	0.1271	0.1867	0.1592	
	(0.0296) ***	(0.0391) ***	(0.0422) ***	LM:
LGHC	0.4345	0.4383	0.4444	$\chi^2(1)= 0.06$
	(0.1284) ***	(0.1214) ***	(0.0818) ***	
LGLA	0.0957	0.1059	0.0997	
	(0.0296) ***	(0.0272) ***	(0.0357) ***	HS:
				$\chi^2(4)= 8.37$*
$\overline{R}^2$	0.3417	0.4152	0.4465	

Notes: 1. Standard errors are in parentheses.
2. ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% level, respectively.
3. Number of observations is 88.

Table 5.6 shows the results for the coastal region from the three models. The results from the three tests indicate that the FES model is statistically superior to the POLS and RES models. Thus we only report the results from the FES model.

Similar to the findings at national level, all of the explanatory variables positive as expected and have an influence on LGGDP in the coastal region at the statistically significant 1% level, except LRDI which is still positive but statistically insignificant. The difference is that LGHC is the most important engine of LGGDP in this region; a 1% increase in LGHC would lead to a 0.44% increase in LGGDP. This result may reveal the fact that the superior conditions of this area lead to the high concentration of human capital, which has in turn been the engine of the regional economic growth.

Table 5.7 Results of panel data estimations for the Central Region, 1985-1999

	POLS	FES	RES	Tests
C	0.9295		1.1012	
	(0.4572) **		(0.4961) **	LR:
LRDI	0.3972	0.5423	0.4623	$\chi^2(8)= 6.64$
	(0.2393)	(0.3330)	(0.2783)	
LRFDI(-1)	0.2563	0.2700	0.2628	
	(0.0404) ***	(0.0375) ***	(0.0373) ***	LM:
LGHC	-0.0611	-0.0404	-0.0523	$\chi^2(1)= 0.84$
	(0.0741)	(0.0895)	(0.0812)	
LGLA	0.1724	0.1816	0.1768	
	(0.0377) ***	(0.0309) ***	(0.0337) ***	HS:
				$\chi^2(4)= 1.69$
$\overline{R}^2$	0.4076	0.4060	0.4399	

Notes: 1. Standard errors are in parentheses.
2. ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% level, respectively.
3. Number of observations is 75.

Table 5.7 shows the results for the central region from the three models. The results from the three tests indicate that the POLS model is statistically superior to the POLS and RES models. Thus we only report the results from the POLS model. In comparison, LRFDI $_{(-1)}$ and LGLA are still positive and significant at the 1% level while LRDI is still positive but insignificant. However, LGHC is no longer significant and also has the wrong sign. The results indicate that FDI and the labour force are important factors driving economic growth in the central region, rather than domestic investment or human capital.

Table 5.8 Results of panel data estimations for the Western Region, 1985-1999

	POLS	FES	RES	Tests
C	-0.7979		-0.7404	
	(0.3514) **		(0.4041) *	LR:
LRDI	0.1467	-0.1822	0.0452	$\chi^2(7)= 13.60$*
	(0.2103)	(0.3361)	(0.2563)	
LRFDI(-1)	0.0664	0.1126	0.0925	
	(0.0236) ***	(0.0342) ***	(0.0313) ***	LM:
LGHC	0.0062	0.0222	0.0018	$\chi^2(1)= 3.27$*
	(0.0833)	(0.0821)	(0.0657)	
LGLA	0.0792	0.0847	0.0849	
	(0.0264) ***	(0.0216) ***	(0.0283) ***	HS:
				$\chi^2(4)= ?$[15]
$\overline{R}^2$	0.0796	0.1986	0.2203	

Notes: 1. Standard errors are in parentheses.
2. ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% level, respectively.
3. Number of observations is 66.

Table 5.8 shows the results for the western region from the three models. The results from the three tests suggest that the FES model is statistically superior to the POLS and RES models. Thus we only report the results from the FES model. In comparison, LRFDI $_{(-1)}$ and LGLA are still positive and significant at the 1% level in this region. However, LRDI is negative and insignificant while LGHC is positive but insignificant. Similar to the central region, regional growth is driven by FDI and the labour force, rather than by domestic investment or human capital.

Before the economic reforms in 1978, China's trade regime was an extreme version of import substitution. However since 1979, the Chinese government adopted the export-oriented policy leading to remarkable expansion in export performance. In 1978, China was ranked thirty-second in export volume. However, China became the

[15] The results of HS test from STATA suggest that RES estimator has degenerated to POLS and the Wald test from HS may not be appropriate.

world's ninth largest exporter in 1999 two decades later. Following Salvatore and Hatcher (1991) and Balasubramanyam, et al. (1996), we add exports as another additional explanatory variable into the estimation equation (5.2). According to Salvatore and Hatcher (1991), there are several reasons for introducing exports into the production function. First, export orientation may lead, *ceteris paribus*, to higher factor productivity. Second, exports may relieve serious foreign exchange constraints and can thereby provide greater access to international markets. Third, exports like FDI may result in a higher rate of technological innovation and dynamic learning from abroad. In turn its contribution will be proportional to the share of exports in the total output. Equation (5.2) can be rewritten in the following form:

$$LGGDP_{it} = \beta_1 LGLA_{it} + \beta_2 LRDI_{it} + \beta_3 LRFDI_{it-1} + \beta_4 LGHC_{it} + \beta_5 LREX_{it} + v_{it} \quad (5.7)$$

where REX is the ratio of exports to GDP, which is expected to positively influence GDP. We conduct the estimation by using the FES model and the empirical results are presented in Table 5.9.

Table 5.9 Results of equation (5.7) from FES model

	Totality	Coastal	Central	Western
LRDI	0.2054	0.2541	0.6209	-0.1803
	(0.1877)	(0.3146)	(0.3445)*	(0.3299)
LRFDI(-1)	0.1757	0.1854	0.2626	0.1008
	(0.0240)***	(0.0380)***	(0.0410)***	(0.0342)***
LGHC	0.1578	0.4382	-0.0500	0.0438
	(0.0693)**	(0.1229)***	(0.0893)	(0.0799)
LGLA	0.1269	0.1066	0.1840	0.0852
	(0.0160)***	(0.0296)***	(0.0323)***	(0.0224)***
LREX	0.1484	0.0158	0.1686	0.2619
	(0.1069)	(0.1786)	(0.2304)	(0.1500)*
$\overline{R}^2$	0.3001	0.4071	0.4051	0.2189

In comparison, the results from Table 5.9 appear consistent with the results obtained from the other tables. Even the magnitudes of the coefficients and the sizes of adjusted R^2 are similar, which highlights the fact that the explanatory power of the equations (5.2) and (5.7) are the same. LREX like LRDI seems to be positive but not significantly affecting the economic growth at national or regional levels except significant in the western region with a 10% significance level. This result may suggest that exports do not have the role, which is assumed in a 'export-led growth hypothesis', on China's economic growth process.

5.6 Conclusions and Policy Implications

The purpose of this chapter was to assess the impact of FDI on China's economic growth. An empirical estimation has been implemented extending previous studies with longer and more recent data sets and different methodologies. Panel data is employed at the province-level across the 29 provinces over the period 1985-1999. The empirical results suggest that the contributions to China's economic growth come mainly from FDI, the labour force, and human capital rather than domestic investment or exports.

FDI is one of the most important factors driving China's remarkable economic growth at both national and regional levels. This is consistent with the theories of Ozawa (1992) and Balasubramanyam, et al. (1996) that FDI is productive for economic growth in the export promoting and outward orientation countries.

Meanwhile, the labour force is another important engine for the rapid national and regional growth, which reveals that China's economy is still at the stage in which GDP growth mainly relies on the labour-intensive industries. At the same time, human capital is also an important factor affecting economic growth at the national level. However, the role of human capital differs at the regional level among the three macro-regions. It is the most important in the coastal region but not in the central or western regions.

In contrast, domestic investment seems to be not statistically significant which is consistent with the view widely held by previous studies as mentioned above. As Borensztein, et al. (1998) pointed out FDI is more productive than domestic investment, contributing to growth especially in developing countries because of its combination of advanced management skills and more modern technology. The foreign firms can thus enjoy lower costs and higher productive efficiency than their domestic competitors. The state-owned enterprises' reform should be conducted further by accelerating industrial restructuring, introducing a market-oriented institutional framework and even by changing the ownership structure toward privatisation. All these should contribute to China's further economic growth.

The empirical evidence also supports the view of some previous studies (Wei, 1993; Berthelemy and Demurger, 2000; Buckley et al., 2002) that exports do not contribute to China's economic growth at either national or regional level.

As mentioned earlier, in the Tenth Five-year Plan (2001-2005) of China the dominant task is to develop the western region of China which covers 56 percent of the country's total land and 23 percent of the nation's population. However, this vast area contributes only 15 percent of the country's GDP and per capita GDP accounts for only 60 percent of the nation's average. To lead to a remarkable economic growth in this region where there exists a huge potential for development, more FDI needs to be attracted. For doing so, the Chinese government thus should provide this area with more preferential policies to foreign investors, encourage the investment in infrastructure for improving the local investment environment, attract more domestic labour force inflows and increase the export performance of this area. As a result, the western regional economic growth will speed up, further reducing the uneven economic development among the three macro-regions, which will eventually enhance China's national competitiveness.

CHAPTER 6

THE IMPACT OF FDI ON CHINA'S EXPORT PERFORMANCE

6.1 Introduction

Countries engage in international trade for a variety of reasons. Exports, in particular, are a means to generate the foreign exchange required to finance the import of goods and services; to obtain economies of specialisation, scale and scope in production; and to learn from the experience in export markets. In a globalising world, furthermore, export performance can serve as a measure for the competitiveness of a country's industries (UNCTAD, 1999).

As another important dimension of the macroeconomic impact of FDI on the host economy, FDI affects the export performance of host countries in various ways. FDI firms, especially export-oriented ones can raise the host country's exports, and facilitate the indigenous firms' access to international markets. In addition to 'direct export' from foreign-invested enterprises, FDI tends to induce exports from indigenous firms through input demand linkage (backward linkage) effects (Athukorala and Menon, 1995; and Sun, 1998). However, FDI could also adversely influence export performance of host countries, for example, cutting off international market shares of indigenous firms. We will further discuss the effects of FDI inflows on the host country's export performance in Section 6.3.

With increasing inflows of FDI into China, the issue of the effect of FDI on China's export performance is becoming increasingly important. This chapter will focus on two aspects. First, whether and how inflows of FDI affect China's total export performance including FDI firms' exports at the province-level. The provinces are then aggregated into the three macro-regions. A panel data set is employed at province-level across 29 provinces over the time period 1985-1999. Second, the effect of FDI on China's indigenous firms export performance is investigated. The same methodology is used, however the panel data time period is shortened to 1990-1999 because of data availability problems.

The rest of the chapter is organised as follows. Section 6.2 introduces the expansion of exports in China with FDI presence. Section 6.3 discusses the theoretical framework and reviews selected literature on the relationship between inflows of FDI and the host country's export performance. Section 6.4 conducts empirical analysis by discussing the model, data, and methodology. Section 6.5 presents the main empirical results and the last section summarises the key conclusions.

6.2 China's Export Performance

As mentioned in Chapter 5, China's trade regime was an extreme version of import substitution before the economic reform in 1978. The characteristics of the pre-reform trade regime can be summarised as below. First, the state monopolised trade through state trade corporations. No firm or individual could export or import goods without the inter-mediation of those corporations. Second, there are no close links between the

world and domestic prices of tradable goods. A state trade corporation purchased imports at the world price, and sold them domestically at a price determined by a state plan, which typically did not vary with world price or domestic demand. Similarly, a state trade corporation purchased exportable goods from domestic firms at a planned price and sold them at the world market price. Third, foreign exchange was tightly controlled by the state. All foreign exchange resulting from exports was retained by the state. All imports had to be part of a state plan to be materialised.

However, since 1979 China opened up to the world, Chinese government adopted the export-oriented policy by taking a few important steps. First, the government has decentralised decision making regarding exports and imports to local governments or regional foreign trade corporations. Second, as noted in Section 3.2 of Chapter 3, a series of special economic zones and coastal open cities are designated for the purpose of stimulating exports and attracting FDI. Third, administrative restrictions on exports and imports are replaced by tariffs, quotas, and licensing. Fourth, the control on foreign exchange has been loosened over the years, particularly for FDI firms. As a result, China has achieved a remarkable expansion in export performance.

In 1978, China was ranked thirty-second in export volume in the world. However, two years later in 1980, China jumped to twenty-sixth. During the two decades from 1980 to 1999, China's exports increased further from US$ 18.1 billion in 1980 to US$ 194.9 billion in 1999, the share of the whole world exports increased from less than 1% in 1980 to 3.6% in 1999. This makes China the ninth largest exporter in the world (see Table 6.1).

Table 6.1 China's export share and ranking in world exports

US$ 100 millions

Year	World exports	China exports	China's share %	Ranking
1980	19906	181	0.9	26
1981	19724	220	1.1	19
1982	18308	223	1.25	17
1983	18078	222	1.2	17
1984	19019	261	1.4	18
1985	19277	274	1.4	17
1986	21157	309	1.5	16
1987	24969	394	1.6	16
1988	28382	475	1.7	16
1989	30361	525	1.7	14
1990	34700	621	1.8	15
1991	35300	717	2.0	13
1992	37000	849	2.3	11
1993	36870	917	2.5	11
1994	41683	1210	2.9	11
1995	50200	1488	3.0	11
1996	52540	1511	2.9	11
1997	55364	1827	3.3	10
1998	53750	1837	3.4	9
1999	53595	1949	3.6	9

Source: *China Foreign Economic Statistical yearbook 2000*

According to FDI theories, most of the MNCs located in developing countries are export-oriented because on the one hand MNCs usually are large firms with scale economies. On the other hand the domestic markets in most developing countries are very small. MNCs in developing countries take advantage of the local cheaper factor inputs including labour and raw materials to reduce their production costs and further improve their international competitiveness. Improved host developing country's export performance probably is led by the increasing of MNCs' exports from the host country. In other words, the indigenous firms' export performance might not improve or even worsen after FDI inflows because of the additional competition.

In the case of China, Table 6.2 shows the export performance of foreign-funded firms in China during the 90's. The ratio of foreign-funded firms' exports to total firms' exports was only 13 percent in 1990, but it dramatically increased to 45 percent in 1999. This fact raised interesting and essential questions as to the empirical analysis of the effects of FDI inflows on both total exports and indigenous firms' exports in China.

Table 6.2 Exports of foreign-funded firms in China

US$100 million

Year	Total firms	Foreign-funded firms	Ratio (%)
1990	620.9	78.1	13
1991	718.4	120.5	17
1992	849.4	173.6	20
1993	917.4	252.4	28
1994	1210.1	347.1	29
1995	1487.8	468.8	32
1996	1510.5	615.1	41
1997	1827.9	749.0	41
1998	1838.1	809.6	44
1999	1949.3	886.3	45

Source: China State Statistical Bureau, computed by the author

Table 6.3 shows that the regional pattern of exports in China is similar to the regional distribution of FDI in China. 86 percent of exports came from the coastal region, only 10 percent and 4 percent came from the central and western regions, respectively. This uneven spatial pattern has also raised interesting and essential questions about whether and how the location pattern of FDI causes the partial regional export performance.

Table 6.3 Actually used FDI and exports by three macro-regions 1985-1999

	FDI (US$ 10,000)	%	Exports (US$10,000)	%
Coastal Region	26,005,322	88	124,678,412	86
Central Region	2,661,927	9	13,971,707	10
Western Region	945,021	3	5,514,237	4
Total	29,612,270	100	144,164,356	100

Source: China State Statistical Bureau, computed by the author

6.3 Theoretical Framework and Literature Review

A country's export performance in the global markets can act as a proxy for expressing the country's international competitiveness. Because production for exports is more footloose than production for consumption in the producing country, a country has more power to determine which producers supply its home market than it does over firms that supply world markets. Shares in export markets therefore may represent the underlying advantages of the country to a greater degree than do shares in domestic markets (Lipsey et al., 1995).

A country's export performance is the sum of the export performance of all national firms, which produce within the boundaries of its home country and serve foreign countries by exports (Nachum, et al. 2001). The circumstances have been changed in two ways after FDI increased dramatically worldwide. As home countries, they invest abroad (outflows of FDI) and produce outside the boundaries of their home countries; while inflows of FDI create production in their countries and some or all of the production may be exported. Under such circumstances, the country's

exports could be either better or worse because outflows of FDI might decrease exports while the inflows of FDI might increase exports of the country.

The effects of inflows of FDI on a host country's export performance could be divided into two aspects. One is the direct effect of FDI referring to export performance of MNCs themselves. Another is the indirect effect of FDI on export performance of indigenous firms (Zhang and Song, 2000). The indirect effect of FDI affects the export performance of indigenous firms in a variety of ways, both positively and negatively (UNCTAD, 1999).

First, export-oriented MNCs facilitate the host country's access to international markets since foreign investors are normally equipped with sound expertise in international trade and possess marketing networks. Indigenous firms may increase their exports by observing the export activities of MNCs and by making use of the infrastructure of transport, communications, and financial services that develop to support those activities (Haddad and Harrison, 1993).

Second, it not only transfers capital, but FDI also transfers new technologies, sound managerial skills, and advanced production methods from investing countries to the host country (Sun, 1998). Moreover, FDI creates technological externalities, knowledge spillovers and demonstration effects for the local economy (Markusen and Venables, 1999). These unique characteristics allow FDI to be a catalyst for the creation of new industries in the host country, improvements in productivity, and export growth of indigenous firms. As a result FDI impacts on structural change, trade and growth can be significant (Kojima, 1985).

Third, MNCs will typically change supplies and demands in a number of related industries. MNCs may create additional competition, which may be beneficial to the indigenous firms in other sectors, for example, through price reductions and 'forward linkages' to indigenous customer firms. FDI may also create demand for local output, in addition to 'direct exports' from MNCs. It tends to induce exports from indigenous firms through input demand linkage (backward linkage) effects and these 'backward linkages' may strengthen supply industries, in turn feeding (via forward linkages) to other indigenous firms (Markusen and Venables, 1999; Sun, 1998). These 'induced exports' could constitute an important portion of exports from indigenous firms in the host country.

However, inflows of FDI could also negatively contribute to host countries. UNCTAD (1999) argued that inflows of FDI may provide too few or the wrong kind of resources and assets, cutting off foreign markets compared with those serviced by indigenous firms, failing to adjust to localised capabilities and needs. Inflows of FDI also can limit the upgrading of indigenous resources and capabilities by restricting local production or low value-added activities and importing the major proportion of higher value-added intermediate products. It may also reduce the opportunities for domestic agglomerative economies by confining its linkages to foreign suppliers and industrial customers.

It is worth mentioning that a number of theoretical and empirical studies have been published on the relationship between FDI and exports. Some of them focused on the impact of outflows of FDI on the home country's export performance (Pfaffermayr, 1994; Morikawa, 1998; Marchant et al., 1999; Blonigen, 2001; Nachum et al., 2001).

Others focused on the impact of inflows of FDI on the host country's export performance (O'Sullivan, 1993; Aitken et al, 1997; Barry and Bradley, 1997; Pain and Wakelin, 1998; Wysokinska, 1998; Leichenko and Erickson, 1997; Sousa et al, 2000). Table 6.4 shows the summary of previous studies on FDI and host countrys' export performance by their main aspects.

Table 6.4 Summary of previous studies on FDI – host exports

Studies	Countries/ industry	Methodology	Results
O'Sullivan (1993)	Ireland	Annual data (1960-78) 2SLS	Foreign-owned firms have contributed significantly to the expansion and diversification of Irish merchandise exports
Aitken et al. (1997)	Mexican manufacturing	Panel data at plant level (1986-90) Standard probit Two-stage probit	There are spillovers from multinational firms, domestic plant exports are positively correlated with proximity to FDI firms, but not from general export activity
Pain and Wakelin (1998)	Eleven OECD countries	Semi-annual panel data (1971-1992) Mean-group estimates	Outward investment has a generally negative impact on trade shares, while inward investment has a positive one
Wysokinska (1998)	Poland	Panel estimates Panel data (1989, 1992)	Positive trend to comparative-advantage for capital-intensive and labour-intensive goods but negative for resource-intensive products
Leichenko and Erickson (1997)	The US Manufacturing	Panel data 2-digit SIC (1980-1991) OLS	Increased levels of FDI are positively related to future improvements in state manufacturing export performance
Sousa et al. (2000)	The UK Manufacturing	Firm level (1992-1996)	Positive spillover effects from MNCs on the decision to export of UK-owned firms as well as on their export propensity
Zhang and Song (2000)	China	Panel data (1986-1997) POLS, RES	FDI are the most statistically significant variable affecting provincial manufacturing export performance
Sun (2001)	China	Panel data (1979-1997) TSCS model	The different market orientations are an important explanation for the differential impacts of FDI on exports across the three macro-regions.
Zhang and Felmingham (2001)	China	Monthly time series (1986-1999) ECM	There is a bidirectional relationship between FDI and exports for China as whole.

In the context of China, some studies were conducted regarding the effects of inflows of FDI on China's trade (including imports and exports) at the national level (Lardy, 1995; Zhang, 1995; Chen, 1999; Sun, 1999; Liu et al., 2001). While others (Zhang and Song, 2000; Sun, 2001; Zhang and Felmingham, 2001) provided insights concerning the impact of inflows of FDI on China's export performance at provincial or regional level. However, these studies do not distinguish between the exports of foreign firms operating in China and those of indigenous firms. In other words, the impact of inflows of FDI on China's indigenous firm's exports has not been the object of any study. This distinction is important however, both from an economic development standpoint and for policy purposes.

Zhang and Song (2000) investigated the role of FDI on China's exports by using POLS and RES models to estimate the panel data across 24 provinces over the period of 1986-1997. They find that a 1 percent change in the level of FDI in the previous year is associated with 0.29% increase in exports in the next year. They also find that inflows of FDI are the most statistically significant variable. They argued that their findings support the widely held belief that increased levels of FDI positively affect provincial manufacturing export performance.

Sun (2001) argued that foreign investments in the coastal region are largely export-oriented, taking advantage of seaport facilities and closeness to overseas markets, while such investments are primarily targeted at the domestic market in the vast inland. The different market orientations are an important explanation for the differential impacts of FDI on exports across the three macro-regions.

Zhang and Felmingham (2001) detect the causal links between FDI inflows and China's exports by using cointegration/error correction modelling (ECM) techniques. The data employed is a monthly time series from 1986-1999. They find that there is a bidirectional relationship between FDI and exports for China as a whole. The relationship varies when China's provinces are divided into three categories, high (H), medium (M), and low (L) FDI recipients. The bidirectional causality relationship still applies in the HFDI and LFDI, but there is a unidirectional relationship where exports Granger cause FDI in the MFDI.

6.4 Model, Data, and Methodology

The empirical models displayed in equations (6.1) and (6.2) below show that total provincial exports depend on inflows of FDI and a number of other variables. The dependent variable TEX employed in model (6.1) represents the total exports from firms in the province including exports from foreign firms. The dependent variable IEX in model (6.2) represents the exports of indigenous firms. The data of this dependent variable is derived by subtracting the amount of exports from foreign firms operating in the province from total provincial exports.

$$TEX = f(FDI, DI, LA, ED, REER) \quad (6.1)$$

$$IEX = f(FDI, DI, LA, ED, REER) \quad (6.2)$$

The most important explanatory variable for the purposes of the study is the flow of foreign direct investment (FDI). A positive relationship between the dependent variables and FDI is expected.

Following Leichenko and Erickson (1997) and Sun (2001), we also include a variable representing provincial domestic investment (DI), which is one of the most important factors of production capacities. An augmented productive capacity created by increasing domestic investment is likely to increase exports. To some extent, domestic investment is a significant predictor of export performance (Leichenko and Erickson, 1997). Like its foreign counterpart we would expect the relationship between DI and the dependent export variables to be positive. As analysed in Chapter 5, the spatial pattern of FDI is similar to the pattern of domestic investment in China. The domestic investment variable is therefore intended to hold constant the effects of these other investment factors.

The variable influencing the quantity of labour employed in the province (LA) is important given that the abundant and low cost Chinese labour force has been a determinant of FDI. In addition to domestic investment, labour therefore is one of the most important factors of production capacities especially in developing countries where exports tend to be labour-intensive products. We do however incorporate a human capital variable (ED) to measure the impact of the quality of the workforce on exports. Trade theory, after the shock created by Leontief's paradoxical results, has been developing its way to new sets of explanations by introducing "non-traditional" factors of production such as skill (Helleiner, 1973). The labour supply influences the export performance not only in terms of production capacities but also through the

quality and the skills of the workers. All other things being equal, the provinces with more highly skilled workers, as measured by education levels would be expected to compete more favourably in terms of competitiveness of exports. We would expect both labour variables to have a positive influence on export performance.

The real effective exchange rate index[16] (REER) is also a factor which should influence export performance. An increase in the REER reflects an appreciation of the Chinese currency (RMB yuan) against other currencies. As a consequence Chinese exports become less competitive. We would expect the relationship between REER and both of the dependent variables to be negative.

The data of FDI is the actually used FDI in China. The data for domestic investment (DI) is total investment in fixed assets. The quantity of labour is the number of staff and workers (LA) in the province, while the number of student enrolment in Specialised Secondary Schools represents the quality of the workforce (ED). REER is the real effective exchange rate index (using the base year 1995=100) as calculated by the International Monetary Fund (IMF). The brief summary of the explanatory variables and their proxies are list in Table 6.5.

[16] A nominal effective exchange rate index represents the ratio of an index of the period average exchange rate of the currency in question to a weighted geometric average of exchange rates for the currencies of selected partner-or competitor-countries. A real effective exchange rate index is defined broadly as a nominal effective exchange rate index adjusted for relative movements in national price or cost indicators of the home country and its partner-or competitor-countries. (IMF, 1993)

Table 6.5 The explanatory variables

Variable	Proxy	Sign
FDI	Actually used FDI	+
Domestic investment	Total investment in fixed assets	+
Labour	The number of staff and workers	+
Human capital	The number of the student enrolled in specialised secondary schools	+
REER	Real effective exchange rate index	-

As domestic investment is reported in RMB yuan while exports and FDI in US dollars, to keep consistency, the period average exchange rates were used to convert exports and FDI into RMB yuan. Total firms' exports, indigenous firms' exports, FDI, and domestic investment exports are expressed in real terms at 1995 constant prices by means of the GDP deflator of China. Table 6.6 shows the different sources for the different data series.

Table 6.6 Data sources

Variable	Description	Source
TEX	Total exports	SSB, *China Statistics yearbook*, various years
IEX	Indigenous firms' exports (IEX = TEX – foreign firms' exports)	SSB, *China Statistics yearbook*, various years SSB, *China Foreign Economic Statistical Yearbook*, various years SSB, *Almanac of China's Foreign Economic Relations and Trade*, various year
FDI	Foreign direct investment	SSB, *China Statistics yearbook*, various years SSB, *China Foreign Economic Statistical Yearbook*, various years SSB, *Almanac of China's Foreign Economic Relations and Trade*, various year
DI	Domestic investment	SSB, *China Statistics yearbook*, various years
LA	Labour	SSB, *China Statistics yearbook*, various years
ED	Education (human capital)	SSB, *China Statistics yearbook*, various years
REER	Real effective exchange rate index	IMF, *International Financial Statistics 2001*

To test the models, panel data, pooled cross-section and time-series data, are employed. The time period considered is 15 years from 1985 to 1999 for estimating model (6.1). Due to the limited availability of the data on foreign funded-firms' exports from China before 1990, the time period considered is shortened to 10 years from 1990 to 1999 for estimating model (6.2). The data cover 29 provinces (autonomous regions and central municipalities). Due to the same reasons as mentioned in Chapter 4, Tibet is excluded and the data for Chongqing and Sicuan province are combined from 1997 onwards.

As discussed in Chapter 4, in order to measure directly the impact of the explanatory variables on the dependent variables in terms of elasticity, the variables in the above equations can be written in logarithmic forms:

$$LTEX_{it} = \alpha + \beta_1 LFDI + \beta_2 LDI_{it} + \beta_3 LLA_{it} + \beta_4 LED_{it} + \beta_5 LREER + u_{it} \quad (6.3)$$

$$LIEX_{it} = \alpha + \beta_1 LFDI + \beta_2 LDI_{it} + \beta_3 LLA_{it} + \beta_4 LED_{it} + \beta_5 LREER + u_{it} \quad (6.4)$$

where L indicates logged values; i and t denote individual province and time, respectively; u_{it} represents the error term. The coefficients β_1, β_2, β_3, β_4, β_5 indicate the percent change in exports associated with a given percent change in FDI, DI, LA, ED, and REER, respectively.

Using the same methodology as the last chapter, the three statistical models POLS, FES, and RES are used to estimate the panel data sets. Also the three tests LR, LM, and HS are applied to identify the best statistical model among the three models.

6.5 Empirical Results

The empirical results from the estimation of equations (6.3) and (6.4) are presented in Table 6.7 and Table 6.8. Table 6.7 is based on panel data across 29 provinces of China over the period 1985-99 for total firms' exports and Table 6.8 is based on panel data across 29 provinces of China over the period of 1990-99 for indigenous firms' exports. It should be noted that a one year lagged FDI is employed in the estimation equations for taking account of the possible simultaneity between exports and FDI and the dynamic process of FDI influence on exports[17]. As Sun (2001) notes, it takes time for the formation of production capacity and resulting changes in productive structure to have an impact. A comparison of the empirical results of the two tables shows some interesting similarities and differences.

It is no surprise that different significance levels and parameter magnitudes are obtained from the three different statistical models, since they are normally sensitive to the assumption of unobservable heterogeneity. The three tests LR, LM, and HS are performed to compare the three statistical models: POLS, FES, and RES. The large values of LR, LM and HS statistics argue in favour of the FES model against the POLS and RES models (except insignificant HS statistics in the western region for total firms' exports), which implies the existence of significant region-specific effects. The FES model is the best model in this case. In addition the explanatory value of the FES estimations, as shown in the adjusted R^2 values, is generally high. The estimation results from POLS, FES, and RES will be presented for comparing analysis.

[17] We also employed a one year lagged DI in the estimation equations for taking account of the dynamic effect of DI on exports, the results obtained are similar to the tables shown in the text.

The empirical results shown in Table 6.7 can be compared to those of similar empirical studies examining the impact of FDI on total export performance. The results show the foreign investment variable to perform much better outside of the western region. In fact the coefficient on the FDI variable is insignificant for all three specifications in the Western region. In contrast FDI has a significant and positive impact on export performance in the central region regardless of how our model is specified. The results for all provinces and the coastal provinces, which dominate provincial exports, are mixed. FDI is shown to have a significant and positive impact in the pooled ordinary least squares (POLS) and random effects specifications (RES). The RES estimates imply that a 1% increase in FDI results, with a one year lag, in a 0.12% increase in exports from all provinces and a 0.24% increase in exports from the coastal provinces. These results are broadly similar to those of Zhang and Song (2000) and Sun (2001).

However our statistically favoured model, the fixed effects model (FES), shows no support for the hypothesis that FDI leads to enhanced export performance. This may be due to the nature of the fixed effect model and the uneven distribution of FDI throughout the provinces. The flow of FDI into a province, along with its 'openness' may be among the dominant factors behind the provincial 'fixed effect', which shifts the regression function. With respect to the western region, our result is similar to that of Sun (2001), who also found the impact of FDI on exports to be insignificant in this region. As noted previously, the export orientation of FDI has been much less pronounced in the inland regions relative to the coastal region.

Table 6.7 shows that other than in the central and western regions, domestic investment (LDI) is just as important as foreign investment in explaining export performance. This may be due to the fact that in China, domestic investment has not been 'crowded out' by its foreign counterpart.

The quantity of labour (LLA) has a positive and significant impact on exports across all three regions and models, with the exception of the FES result in the Central region. This may be attributed to the competitive advantage of Chinese products produced by labour intensive processes in world markets. The variable representing labour quality (LED) is positive and significant in the preferred fixed effects model across all three regions. We would expect this to be the case, particularly as higher value-added goods are increasingly exported from China. Curiously however, the coefficients for this variable are negative in all four results using the POLS model. We cannot therefore claim that the results for this variable are completely robust.

The expected negative sign for the exchange rate variable (LREER) appears in most of the results in Table 6.7. The variable is also significant in eight out of the twelve equations presented. As the Chinese currency appreciates the exports of the foreign and indigenous firms combined become less competitive on world markets.

Table 6.8 shows the estimation results for equation 6.4, where the focus is on the export performance of indigenous firms only. In contrast to the results in Table 6.7 for all firms, the impact of foreign direct investment on the exports of indigenous firms is less strong, particularly in the central region. In fact the variable is only highly significant in the POLS model for all regions and the coastal and central

regions. FDI in the Western region appears to have had no impact on the export performance of indigenous firms. For this region the results are similar to the finding for all firms in Table 6.7.

Table 6.8 shows that the pattern of results for the domestic investment (LDI) variable and the quantity of labour variable (LLA) are similar to those of Table 6.7. Domestic investment seems to have a generally positive impact on the export performance of indigenous firms, except for those in the central region. The quantity of labour available in a province has a strong positive and significant impact on exports from indigenous firms. Coefficients for the quality of labour variable (LED) are positive and highly significant in the FES model for indigenous firms in the coastal provinces and for all provinces. The significance is less strong in the western provinces and absent in the central provinces. The results may indicate differences in the nature of products produced amongst regions.

Interestingly the exchange rate variable has a much weaker influence on the exports of indigenous firms than on the exports of all firms in a region. In fact Table 6.8 shows the coefficients for this variable to have the expected negative sign in only two instances.

Table 6.7 Results for total firms' exports from China by regions, 1985-1999 (Equation 6.3)

Region	C	$LFDI_{(-1)}$	LDI	LLA	LED	LREER	Adjusted R^2	Tests
All								
POLS	-10.5634	0.4008	1.1834	0.6658	-0.8532	0.8983	0.8437	LR: $\chi^2(28)$= 226.69***
	(1.1509) ***	(0.0434) ***	(0.0772) ***	(0.0699) ***	(0.0784) ***	(0.1747) ***		
FES	0.5085	0.0275	0.3750	0.2526	0.5403	-0.5115	0.9491	LM: $\chi^2(1)$= 494.09***
	(2.0106)	(0.0403)	(0.0842) ***	(0.0725) ***	(0.1243) ***	(0.1521) ***		
RES	-3.1875	0.1244	0.6967	0.4238	-0.0038	-0.0971	0.9372	HS: $\chi^2(5)$= 276.28***
	(1.6106) **	(0.0399) ***	(0.0828) ***	(0.0672) ***	(0.1104)	(0.1461)		
Coastal								
POLS	-13.1729	0.5816	0.9202	0.6092	-0.4524	1.3578	0.7999	LR: $\chi^2(11)$= 93.21***
	(2.1162) ***	(0.0823) ***	(0.1211) ***	(0.1195) ***	(0.1296) ***	(0.2998) ***		
FES	-7.4705	-0.0947	0.5679	0.3021	0.8627	-0.1018	0.9347	LM: $\chi^2(1)$= 220.31***
	(3.3488) **	(0.0931)	(0.1205) ***	(0.1223) **	(0.1891) ***	(0.2425)		
RES	-5.6900	0.2419	0.7358	0.3569	0.0830	0.2924	0.9064	HS: $\chi^2(5)$= 722.24***
	(2.4357) **	(0.0771) ***	(0.1213) ***	(0.1137) ***	(0.1580)	(0.2522)		
Central								
POLS	1.9351	0.2564	0.3073	0.6325	-0.2747	-0.1502	0.6377	LR: $\chi^2(8)$= 32.36***
	(2.2538)	(0.0622) ***	(0.1331) **	(0.1045) ***	(0.1324) **	(0.2455)		
FES	16.7036	0.1919	-0.2700	0.0207	0.4269	-1.1067	0.7762	LM: $\chi^2(1)$= 50.54***
	(3.8304) ***	(0.0635) ***	(0.1908)	(0.1374)	(0.2398) *	(0.2619) ***		
RES	10.5794	0.2005	0.0229	0.2520	0.1190	-0.7491	0.7600	HS: $\chi^2(5)$= 15.20***
	(3.2536) ***	(0.0612) ***	(0.1666)	(0.1220) **	(0.2025)	(0.2452) ***		
Western								
POLS	0.2491	0.06723	0.6586	0.3246	-0.0186	-0.4210	0.8930	LR: $\chi^2(7)$= 25.08***
	(1.4880)	(0.0514)	(0.0970) ***	(0.0875) ***	(0.1151)	(0.2078) **		
FES	1.9862	0.0701	0.1566	0.2398	0.7151	-0.6944	0.9286	LM: $\chi^2(1)$= 36.66***
	(2.8257)	(0.0516)	(0.1579)	(0.0977) **	(0.2612) ***	(0.2286) ***		
RES	2.5876	0.0671	0.4084	0.2680	0.2737	-0.6546	0.9244	HS: $\chi^2(5)$= 8.01
	(1.8691)	(0.0505)	(0.1249) ***	(0.0886) ***	(0.1586) *	(0.2026) ***		

Notes:

1. Standard errors are in parentheses.
2. ***, **, and * indicate that the coefficient is significant at the 1%, 5%, and 10% level, respectively.
3. Number of observation for all regions is 388, for coastal region is 163, for central region is 124, for western region is 101.

Table 6.8 Results for indigenous firms' exports from China by regions, 1990-1999 (Equation 6.4)

Region	C	$LFDI_{(-1)}$	LDI	LLA	LED	LREER	Adjusted R^2	Tests
All								
POLS	-12.1100	0.3183	1.0039	1.0572	-0.9765	0.8966	0.8332	LR: $\chi^2(28)$= 163.14***
	(1.6007) ***	(0.0526) ***	(0.0869) ***	(0.0860) ***	(0.0848) ***	(0.2856) ***		
FES	-12.7992	-0.0407	0.2843	1.1040	0.4554	0.1086	0.9492	LM: $\chi^2(1)$= 311.26***
	(3.9147) ***	(0.0485)	(0.1030) ***	(0.1935) ***	(0.1580) ***	(0.1825)		
RES	-8.8813	0.0807	0.6365	0.9431	-0.3207	0.4214	0.9366	HS: $\chi^2(5)$= 92.49***
	(1.8924) ***	(0.0487) *	(0.0978) ***	(0.1003) ***	(0.1243) **	(0.1905) **		
Coastal								
POLS	-14.2133	0.3490	0.9508	0.9820	-0.7373	1.1741	0.7684	LR: $\chi^2(11)$= 66.35***
	(2.7634) ***	(0.1223) ***	(0.1548) ***	(0.1570) ***	(0.1499) ***	(0.4647) **		
FES	-18.6345	-0.1632	0.3804	1.2652	0.6762	0.2375	0.9282	LM: $\chi^2(1)$= 135.00***
	(6.3859) ***	(0.1289)	(0.1610) **	(0.3086) ***	(0.2416) ***	(0.3072)		
RES	-7.8097	0.0847	0.5296	0.7925	-0.0431	0.4498	0.9138	HS: $\chi^2(5)$= 44.56***
	(3.2535) **	(0.1175)	(0.1614) ***	(0.1825) ***	(0.1941)	(0.3224)		
Central								
POLS	-3.1845	0.2921	0.0141	1.1763	-0.3209	0.1646	0.4772	LR: $\chi^2(8)$= 28.17***
	(2.9199)	(0.0886) ***	(0.1892)	(0.1653) ***	(0.1577) **	(0.3915)		
FES	-3.867279	0.0413	-0.1914	0.9774	0.5893	-0.3918	0.7191	LM: $\chi^2(1)$= 52.80***
	(7.1570)	(0.0869)	(0.2735)	(0.3375) ***	(0.3612)	(0.3509)		
RES	-1.6346	0.1009	0.0120	0.8947	0.1414	-0.1916	0.7189	HS: $\chi^2(5)$= 10.90*
	(4.8002)	(0.0813)	(0.2330)	(0.2352) ***	(0.2730)	(0.3297)		
Western								
POLS	-3.0722	0.09924	0.4967	0.5781	-0.1394	0.2488	0.8725	LR: $\chi^2(7)$= 21.28***
	(1.9798)	(0.0621)	(0.1051) ***	(0.1328) ***	(0.1504)	(0.3518)		
FES	-9.5106	0.0142	0.1346	0.7890	0.6740	0.2489	0.9229	LM: $\chi^2(1)$= 32.72***
	(7.1221)	(0.0617)	(0.1932)	(0.3569) **	(0.3458) *	(0.2900)		
RES	-2.0514	0.0448	0.3517	0.4951	0.1080	0.2095	0.9177	HS: $\chi^2(5)$= 71.60***
	(2.3100)	(0.05836)	(0.1448) **	(0.1539) ***	(0.2132)	(0.2876)		

Notes:

1. Standard errors are in parentheses.
2. ***, **, and * indicate that the coefficient is significant at the 1%, 5%, and 10% level, respectively.
3. Number of observation for all regions is 284, for coastal region is 120, for central region is 90, for western region is 74.

6.6 Conclusions and Policy Implications

The chapter tried to provide a comprehensive investigation of China's international competitiveness associated with FDI presence by assessing the effects of inflows of FDI on all firms' exports and indigenous firms' exports from China. This chapter contributes to the existing literature of the impact of inflows of FDI on the host country's export performance. It also examines how FDI affects indigenous firm's exports from China by which we can see the impact of FDI on China's international competitiveness.

We used panel data at the province-level across the 29 provinces, which were subdivided into three macro-regions. The most important finding is inflows of FDI improve the competitiveness of total firms' exports in China especially in the central region. However, it seems inflows of FDI did not influence China's export performance in the western region. There are two potential reasons. First, the inflow of FDI located in that area has been lower; second, the inflows of FDI aim to take advantage of the vast local market rather than exports. The regional pattern of the impact of FDI on exports from China is similar to the regional distribution of FDI in China.

Unlike FDI's significant contribution to China's remarkable economic growth, which was analysed in the last chapter, FDI has less influence on the export performance of indigenous firms than all firms (foreign and indigenous). This implies that the direct effects of FDI on China's exports are stronger than the indirect effects.

The findings also indicated that only weak linkages exist between foreign and indigenous firms in China. To some extent this may be due to the nature of production undertaken by foreign firms in China.

We also find domestic investment, labour, and human capital are the important factors for driving export performance in the three macro-regions of China which implied that main export products from China are labour-intensive and capital-intensive products. The real effective exchange rate has an important effect on the export performance of total firms in China and a much weaker effect on indigenous firms.

From a policy point of view, to promote China's export performance and enhance its international competitiveness, the linkages between FDI firms and indigenous firms need to be strengthened while the Chinese government provides further preferential policies to increase FDI inflows.

CHAPTER 7

THE IMPACT OF FDI ON THE PRODUCTIVITY OF CHINA'S AUTOMOTIVE INDUSTRY

7.1 Introduction

In Chapter 5 and Chapter 6, we have discussed the macroeconomic effects of FDI inflows on China's economic growth and export performance. This chapter will discuss the impact of FDI on China's automotive industrial productivity from a microeconomic dimension. We contribute to the present literature on FDI by examining the effect of FDI presence on the intra-industry productivity of the host country by using a small panel data of China's automotive industry. It will be argued that China's competitiveness will be enhanced if MNCs actually promote China's industrial productivity.

The automotive industry is selected for study for several reasons. First, the automotive industry is one of the six key industries[18] in China. Also it has expanded very rapidly over the reform years and typically accounts for a large increasing share of industrial production, output, exports, and employment. In 1999, total sales of China's auto-industry were about US$ 38 billion, accounting for nearly 4 percent of the country's GDP. In 1998, seven million employees worked in auto-industry of China, accounting for 3.3 percent of the total Chinese urban workforce (Harwit,

[18] Six key industries in China are automotive, electronics and telecommunications, electric appliances, power station equipment, chemicals, and steel (Li and Yeung, 1999).

2001). The automotive industry, particularly in the industrialised countries, is very prominent due to its major contribution to GNP and employment (Irandoust, 1999). In the United States, Japan, and South Korea, automotive exports are the backbone of their foreign economic policy. Second, China's automotive industry has encompassed both domestic and foreign economic and decision processes. It is therefore possible to investigate problems not only of industrialisation in general, but also of technology transfers (Harwitt, 1995). Third, there is a significant amount of FDI inflow into the automotive industry. By the end of 2000, the cumulative actually used FDI in the automotive industry reached US$ 45.4 billion accounting for 13% of the totally actually used FDI in China.

China's entry into the WTO forces China's automotive industry to face fierce international competition and tremendous pressure. As Sit and Liu (2000) pointed out, China's entry into the WTO would have two effects on China's automotive industry: one is the gradual reduction of tariffs on imported auto production and the other is the further opening of the industry to FDI. With increasing inflows of FDI into China's automotive industry, it is essential and significant to understand the effect of FDI on industrial productivity.

There is increasing interest in the impact of FDI on the host country's productivity in the literature. However contradictory empirical results have been obtained from previous studies. According to Bertschek (1995), FDI like imports has positive effects on the competitive behaviour of domestic firms. This is because competition in the domestic market is thereby increased, and domestic firms have to perform more efficiently to maintain their market position. High rates of productivity growth are

often sought as a way of strengthening competitiveness. It will be argued that the host country's competitiveness will be enhanced if MNCs actually promote the host country's industrial productivity.

The rest of the chapter is organised as follows. Section 7.2 introduces FDI and China's automotive industry. Section 7.3 discusses the theoretical framework and reviews selected literature. Section 7.4 conducts empirical analysis by discussing the model, data, and methodology. Section 7.5 presents the empirical results and the last section summarises the key conclusions and policy implications.

7.2 FDI and China's Automotive Industry

According to the *Chinese Automotive Industry Yearbook* (1999), the development of China's automotive industry after 1949, when the People's Republic of China was set up, can be split into three different phases. The period of 1949-65 is the first early 'starting phase'. The second 'growing up phase' was in the time period 1966-80. Since 1981, China's automotive industry has been in the 'rapidly developing phase'.

Since the 1950s, the Chinese government has made several attempts to introduce Soviet-style experience in order to achieve the goal of industrialisation. China's automotive industry stemmed from the founding of the First Automotive Works (FAW) in Changchun, Jilin province, which is now the largest state-owned auto-maker in China. In July 1953, China and the Soviet Union reached an agreement to introduce Soviet automotive technology and assembly lines to produce medium trucks

with a projected capacity of 30,000 units. China's first truck was produced by FAW in 1956, marking the birth of China's automotive industry. Nanjing Automotive Works was set up in March of 1958, Beijing Automotive Works in June of the same year, Jinan Automotive Works in April 1960, and Shanghai Automotive works in Oct 1960. The Chinese automotive industry then had five production bases and 104 plants, including one vehicle assembler, one motor engine maker, sixteen repair plants, and eighteen motor and motorcycle parts producers. In 1965, 40,542 units of automotive vehicles were produced, of which only 133 were cars (see Table 7.1), accounting for 0.3 percent of the total output.

China's automotive industry grew up in its second stage. In March of 1966, Sichuan Automotive Works was set up in Chongqing, Sichuan province. In April of 1967, Second Automotive Works (SAW) was set up in Shiyan, Hubei province. In March of 1978, Shannxi Automotive Works was set up in Xian. Moreover, three new firms emerged as important automotive vehicle production sites in Tianjin, Shenyang, and Wuhan. During this period, most provinces and autonomous regions, and even cities of China, set up their local automotive production. By 1980 the number of automotive enterprises had risen to 2,379, consisting of 56 vehicle manufacturers, 129 repair plants, 24 motorcycle makers, 33 motor engine makers and 2,076 parts producers. In 1980, 222,288 units of automotive vehicles were produced, of which 135,500 were trucks and 5,418 were cars (see Table 7.1), accounting for 61 percent and 2.4 percent of the total output respectively.

However, in the absence of competition, all production units ran at low levels of productivity and efficiency. Central planning also created another problem, which is

the lack of product scope. The result was a fragmented production system with a severe over-capacity of auto production nation-wide, characterised by diseconomies of scale.

The opening up of China's economy brought about unprecedented opportunities as well as challenges for its automotive industry. Domestic demand for cars (initially from the government sectors for official use) rose rapidly in the 1980s. However, China's vehicle producers were truck-makers rather than car-makers. The car industry was a minor part of vehicle production during the first three decades of China's socialist economy and unable to meet increasing demand. Since the early 1980s, car imports increased dramatically in China (see Table 7.1).

The Chinese government began to encourage FDI in auto production by setting up joint ventures with auto producing MNCs. Five major project agreements were achieved between 1984 and 1989. The first one was a joint venture between the Shanghai Automotive Industry Corporation and Volkswagen of Germany. The second one was between the Beijing Automotive Works and Chrysler of the United States. The third one was between the Guangzhou Automotive Company and Peugeot of France. The fourth one was between the FAW and Volkswagen-Audi. The last one was a licence agreement for technology transfer from Daihatsu of Japan to the Tianjin Automotive Industry Corporation. These joint ventures started their production by assembling cars with assembled parts and the individual components imported from foreign makers.

Although these joint ventures were still at the stage of import substitution, they helped reduce the financial burden imposed by the imports of completed foreign cars. Moreover, to the indigenous firms, the introduction of market competition placed increasing pressure on manufacturing operations and growth. They sought to improve their technological capability in the interest of industrial competitiveness, first at home, and then globally. Also because the automotive industry is both capital and technology intensive, joint ventures became a channel for attracting foreign investment, obtaining modern manufacturing technology, and learning modern management techniques. As foreign investors, which are part of an integrated international production system, MNCs attempt to acquire greater access to markets and resources. Rapid economic growth and a huge population provide a ready market for their automotive products in China. China is an obvious attraction with its untapped market.

In 1994, the Chinese government identified five pillar industries, including the machine-building, electronics, automotive, petroleum and construction sectors, which it intended to foster through structural adjustment. It's goal was to nurture competitive modern firms by such means as mergers and acquisitions (Zhang and Taylor, 2001).

China's automotive industry has developed impressively during its third stage, since the introduction of Sino-foreign joint ventures. China produced 1.83 million automotive vehicles in 1999 (see Table 7.1), ranking China in the top ten of automotive vehicle production in terms of world output according to OICA[19] (*China Automotive Industry Yearbook*, 2000).

[19] International Organisation of Automobile Manufacturers

China's automotive industry now consists of FDI firms, centrally planned state-owned firms, locally planned state-owned firms, township enterprises, and private enterprises. By the end of 2000, there were more than 600 FDI firms set up in China's automotive industry from more than 20 countries and areas. The cumulative contracted FDI amounted to US$ 52.9 billion, while the actually used FDI reached US$45.4 billion (*Chinese Automotive Industry Yearbook*, 2000), which is 13% of totally actually used FDI in China. The major sources of foreign investment are from Hong Kong, the US, Germany, Japan, France, Italy, South Korea, and the UK.

Table 7.1 China's automotive industry 1955-1999

Unit

Year	Output		Import		Export	
	Total	Car	Total	Car	Total	Car
1955	61	0				
1956	1654	0	56466	4067	0	
1957	7904	0	(1953-57)	(1953-57)	(1953-57)	
1958	16000	57				
1959	19601	101	68157	3048	1317	
1960	22574	98	(1958-62)	(1958-62)	(1958-62)	
1961	3589	5				
1962	9740	11				
1963	20579	11	18549	4266	2695	
1964	28062	100	(1963-65)	(1963-65)	(1963-65)	
1965	40542	133				
1966	55861	302				
1967	20381	144	41200	949	5952	
1968	25100	279	(1966-70)	(1966-70)	(1966-70)	
1969	53100	163				
1970	87166	196				
1971	111022	562				
1972	108227	661				
1973	116193	1130	97863	2317	21267	
1974	104771	1508	(1971-75)	(1971-75)	(1971-75)	
1975	139800	1819				
1976	135200	2611				
1977	125400	2330	141926	20292	4449	
1978	149062	2640	(1976-80)	(1976-80)	(1976-80)	
1979	185700	4152				
1980	222288	5418				
1981	175645	3428	41575	1401	726	
1982	196304	4030	16077	1101	238	
1983	239886	6046	25156	5806	1892	
1984	316367	6010	88743	21651	2919	
1985	443377	5207	353992	105775	1659	
1986	372753	12297	150052	48276	4179	
1987	472538	29865	67182	30536	6129	
1988	646951	36798	99233	57433	9159	
1989	586936	28820	85554	45000	2676	6
1990	509242	42409	65430	34063	4431	73
1991	708820	81055	98454	54009	4108	789
1992	1061721	162725	210087	115641	6375	914
1993	1296778	229697	310099	180717	11116	2866
1994	1353368	250333	283060	169995	18648	784
1995	1452697	325461	158115	129176	17747	1413
1996	1474905	391099	75863	57942	15112	635
1997	1582628	487695	49039	32019	14868	1073
1998	1629026	507861	40216	18016	13627	653
1999	1829396	566265	35192	19953	10095	326

Source: *Chinese Automotive Industry Yearbook* (1999, 2000)

7.3 Theoretical Framework and Literature Review

The effects of FDI inflows on industrial productivity of the host country can be split into two aspects: direct and indirect effects. The direct effect refers to the higher productivity of MNCs themselves, which raises aggregate productivity of the host country, while the indirect effect of FDI refers to the impact of FDI on the productivity of indigenous firms. The indirect effect of FDI can be positive or negative.

The direct effect is the first of the productivity benefits from foreign firms. A large number of foreign firms will raise aggregate productivity through a composition effect (Girma, et al., 2001). MNCs must have inherent advantages that allow them to overcome the higher costs of becoming a multinational (Hymer, 1976). They may have higher productivity than indigenous firms because of their superior technological knowledge, access to international networks and superior management structures (Girma, et al., 2001). MNCs may also exhibit higher levels of productivity than their domestic counterparts, due to a number of factors: employees who have greater skills and training; more machinery and equipment per worker; and greater technical efficiency.

A number of studies have focused on productivity differences between foreign and local firms in developing countries. Zhou et al. (2002) argued that the productivity of FDI-related firms is significantly higher than that of indigenous firms in China. Willmore (1986) pointed out that foreign firms in Brazil typically have higher levels of labour productivity compared to indigenous firms of a similar size operating in the

same industry. Using detailed Indonesian data, Blomstrom and Sjoholm (1999) found that labour productivity is higher in establishments with foreign equity than in purely domestically owned firms and that the latter benefit from spillovers from FDI.

Indirect effects can have either positive or negative impacts. The presence of foreign firms may have a positive effect on the productivity of indigenous firms if there are spillovers from foreign firms to indigenous firms. However, negative effects may reduce the productivity of indigenous firms, particularly in the short run. Kinoshita (1998) decomposed spillover effects from FDI into four categories: the demonstration-imitation effect, the competition effect, the foreign linkage effect, and the training effect.

Firstly the demonstration-imitation effect arises from differences in the levels of technology between foreign and indigenous firms. Foreign firms with more advanced technologies enter a local market and introduce newer technologies to the industry. Through direct contact with foreign affiliates, local firms can watch and imitate the way foreigners operate and can therefore become more productive.

Secondly the competition effect arises from the additional competition created by MNCs. FDI may have positive effects on the competitive behaviour of domestic firms and negative effects on their profitability. Because competition on the domestic market is increased, domestic firms have to perform more efficiently to maintain their market position (Bertschek, 1995). Local industry and local firms are forced to be more efficient in using existing technologies and resources because foreign firms lead to more intense competition. This type of spillover generally occurs on an intra-

industry scope. Also increased competition may be able to eliminate monopolistic profits and enhance the welfare of a host country.

Thirdly spillovers through backward and forward linkages may arise when foreign affiliates enter into transactions with local suppliers and customers. This effect represents inter-industry spillovers.

Finally a training effect may be realised. MNCs maybe only able to transfer superior technology to their foreign affiliates after having trained local workers. The training may be provided by foreign joint venture partners, foreign buyers or suppliers. Also, indigenous firms may train their own workers to increase product quality in order to cope with foreign competition. Also spillovers could occur through labour turnover from MNCs to indigenous firms. However, this type of spillover may not materialise if there is very little labour mobility between MNCs and indigenous firms (Fosfuri, et al., 2001).

However, it is argued that spillovers may not materialise if the technology gap between foreign and local firms is too large. Local firms may in fact become less competitive and eventually may be displaced by foreign firms (Cantwell, 1995). In contrast, the model of Wang and Blomstrom (1992) predicts a positive relationship between the degree of spillovers from FDI and the size of the technology gap between foreign and indigenous firms. Kokko et al. (1996) found that spillovers are present when the technology gaps are moderate.

A high foreign presence may have a negative impact if foreign firms take the best workers from domestic firms, leaving them with low wage and less productive employees. There is also a possibility that the competition effect may be harmful to a host economy when indigenous firms are not efficient enough to compete with foreign firms. In this case, indigenous firms may be eliminated from the market.

Caves (1974) tested several hypotheses about the effects of FDI on indigenous firms in Canada and Australia. The results showed the effects in three aspects: Firstly, MNCs may raise productivity levels among indigenous firms in the industries, which they enter by improving the allocation of resource in those industries. Secondly, through either the MNCs' competitive force or demonstration effect, indigenous firms operating in imperfect markets may be induced to a higher level of technical or X-efficiency (Leibenstein, 1966). Thirdly, the presence of MNCs in an industry may speed the process or lower the cost of the transfer of new technology. The threat of competition may force indigenous firms, which might otherwise have been laggards to adopt best practice technology sooner.

Numerous case studies have shown that the technology and productivity of indigenous firms may improve as MNCs enter the market and demonstrate new products and technologies, provide technical assistance to their local suppliers and customers, and train workers and managers who are later employed by indigenous firms. The competitive pressure exerted by MNCs may also force indigenous firms to operate more efficiently and introduce new technologies (Kokko, et al., 1996). In order to remain competitive, indigenous firms may have to increase their innovative activity and R&D expenditure (Bertschek, 1995). However some econometric

estimations show a negative effect regarding the presence of MNCs on spillovers and R&D activity of indigenous firms (Aitken and Harrison, 1999; Veugelers and Vanden Houte, 1990) or a small impact of FDI on indigenous firms' productivity (Haddad and Harrison, 1993). Similar conclusions were shown in the case of China by Fan (1999). He showed that indigenous firms' behaviour is critical in determining the impact of FDI on indigenous firms' total factor productivity (TFP) growth. TFP growth of collective firms[20] is positively related to FDI, while that of the state-owned firms[21] is negatively related to FDI in China. Table 7.2 provides a summary of previous studies of the impact of FDI on the productivity of host countries.

[20] Collective firms are formally owned by local governments at the urban and rural levels and include township and village enterprises.
[21] State-owned firms are formally owned by all of the people but are controlled by central, provincial or local governments.

Table 7.2 Summary of previous studies on FDI-productivity

Studies	Countries/Industry	Data/Econometric technique	Results – the effects of FDI inflows on host country's productivity
Caves (1974)	Canada and Australia Manufacturing sectors	Industry-level (1965-67 Canada; 1962, 1966 Australia)	Lagged FDI positively affected value-added per worker in domestic firms while changes in FDI had a negative impact
Kokko, et al. (1996)	Uruguayan Manufacturing sector	Plant-level (1988) OLS	Positive and significant in the sub-sample of plants with moderate technology gaps vis-à-vis foreign firms
Egger and Pfaffermayr (2001)	Austria Manufacturing sectors	Panel data (1981-94) FES	General and labour-augmenting productivity improving
Girma, et al. (2001)	UK Manufacturing sector	Firm-level Panel data (1991-1996)	Higher productivity of foreign firms raise aggregate productivity but on average no productivity spillovers to domestic firms
Zukowska-Gagelmann (2000)	Poland Manufacturing sector	Firm-level (1993-97) OLS	A higher foreign presence in an industry affects local firms negatively while positive impact on performance of the whole domestic industry including foreign firms
Djankov and Hoekman (2000)	Czech Republic	Firm-level (1992-96) OLS, RES	Positive on TFP growth of recipient firms but negative on firms that do not have foreign partnerships
Kokko (1994)	Mexico Manufacturing sectors	Industry-level (1970) OLS, 3SLS	Positive spillovers from competition between local firms and foreign affiliates but excludes suspected 'enclaves'
Blomstrom and Persson (1983)	Mexico Manufacturing sectors	Industry-level (1970) OLS	Positive spillovers of technical efficiency between domestic plants and the foreign participation of various industries
Kholdy (1995)	Mexico, Brazil, Chile, Singapore, and Zambia Manufacturing sector	Industry-level (1970-90) Causality test	No evidence of spillover efficiency as defined by higher labour productivity and capital formation in the host developing countries merely as a result of the presence of FDI
Haddad and Harrison (1993)	Morocco Manufacturing sector	Firm-level (1985-89)	The dispersion of productivity is smaller in the sectors with more foreign firms. No evidence of FDI accelerated productivity growth or technology spillovers in domestic firms
Aitken and Harrison (1999)	Venezuela industry	Plant-level Panel data (1979-89, excluding 1980), OLS	Positive on small FDI recipient plants but negative on indigenous plants, the net impact of FDI is quite small
Globerman (1979)	Canada Manufacturing sectors	Plant-level (1972)	Negative relationship between FDI and domestic firm labour productivity because of any positive spillovers may be offset by the negative impact of greater competition
Zhou, et al. (2002)	China Manufacturing sectors	Firm-level (1992-95) SAS, REG	Domestic firms in regions that attract more FDI or have a longer history of FDI tend to have higher productivity while domestic firms in industries that have more FDI or have a longer history of FDI tend to have lower productivity

7.4 Model, Data, and Methodology

The conventional approach is to investigate the effect of FDI inflows on productivity by using a Cobb-Douglas production function. Following previous studies (Caves, 1974; Globerman, 1979; Blomstrom and Persson, 1983; Kokko, 1994; Egger and Pfaffermayr, 2001; Gorg and Strobl, 2002), we use a formal model of the production function to detect the impact of FDI inflows on the productivity of China's automotive industry. By including more theoretically relevant explanatory variables in the estimation equation, the biases due to the omission of variables can be substantially reduced (Buckley et al., 2002). The estimation equation is set up as below:

$$LP = f(CI, FS, LQ, RFI, RIN, TO) \qquad (7.1)$$

LP (Labour Productivity) as the dependent variable is the ratio of industry value-added to the annual average number of staff and workers in the sub-sectors of China's automotive industry.

CI (Capital Intensity) is the ratio of the net value of fixed assets to the annual average number of staff and workers. The more machinery and equipment used by each employee, the higher level of automation the firm has, which likely leads to higher productivity.

FS (Firm Size) is the ratio of gross industrial output value to the number of firms. Firm size represents the firm's scale economies. According to production theory, the

unit production cost will decrease as the quantity produced increases, therefore, larger firm sizes lead to higher productivity.

LQ (Labour Quality) is the ratio of the number of technical staff to the annual average number of staff and workers. Labour quality indicates the level of skill or education of the labour force. The use of the number of technical staff offers a more direct measure of the average skill/education level of the labour force than the use of primary and secondary school enrolment, since there is a time lag between school enrolment and entry into labour force. It can be expected that higher labour quality increases productivity.

RFI (Foreign Investment) is the ratio of foreign investment to total capital. As mentioned above, FDI not only transfers capital but also transfer new technologies, managerial skills, and advanced production functions. Therefore, the more foreign investment inflows, the higher productivity will be.

RIN (Innovation) is the ratio of innovation investment to total investment. Innovation represents the new methods, ideas, or products introduced in production action or process. Thus, more innovation investment will lead to higher productivity.

TO (Turnover of Working Capital) is the annual turnover times of working capital. Obviously, the faster is the speed of the working capital turnover, the higher the productivity.

All of the value variables are at 1995 constant prices. We expect that every explanatory variable will positively influence labour productivity, which includes the direct and indirect effects of FDI in China's automotive industry. To test the model, a small panel data of China's automotive industry is employed. The time period considered is 5 years from 1995 to 1999. Data is from *China Automotive Industry Yearbook* 1996-2000, in which China's automotive industry is divided into five sub-sectors: Auto-manufacturing, Auto-assembling, Motor-manufacturing, Vehicle-engine, and Vehicle-parts (see Table 7.3).

Table 7.3 China's automotive industry by sub-sector 1995-1999

Variable	Sub-sector	1995	1996	1997	1998	1999
CI	Auto-manufacturing	4.5742558	6.2688892	9.0959735	9.8805414	14.893051
	Auto-assembling	2.2602812	3.2361879	3.7553854	4.3146843	5.7644928
	Motor-manufacturing	3.8767455	5.0499728	6.1212909	8.303593	9.3519668
	Vehicle engine	3.1400503	4.6611794	5.1773525	5.8902539	9.6964367
	Vehicle parts	2.5262449	3.2333535	3.8417525	4.8889233	6.1122707
FS	Auto-manufacturing	83746.984	96589.787	121157.57	131322.49	145319.65
	Auto-assembling	3026.7597	3615.4192	3907.7794	4717.6914	4645.0495
	Motor-manufacturing	35180.33	36673.331	37632.993	54353.931	62051.336
	Vehicle engine	13907.115	13158.032	15532.519	18129.143	23138.373
	Vehicle parts	2240.3232	2570.2637	3112.1928	3524.4005	4288.4156
LQ	Auto-manufacturing	0.0927242	0.0898452	0.0923135	0.0863653	0.0940836
	Auto-assembling	0.0842533	0.0839291	0.0844614	0.0836696	0.0952829
	Motor-manufacturing	0.0824712	0.0804882	0.0818508	0.0899097	0.0906366
	Vehicle engine	0.1089765	0.1043297	0.1075615	0.0990893	0.0953243
	Vehicle parts	0.07589	0.0817157	0.0811973	0.0848694	0.0933093
RFI	Auto-manufacturing	0.0383161	0.0068772	0.0194796	0.0161251	0.0176689
	Auto-assembling	0.005667	0.0026935	0.0019939	0.0043458	0.0027547
	Motor-manufacturing	0.0211781	0.0071269	0.0074143	0.0012396	0.0012174
	Vehicle engine	0.0338106	0.0103632	0.0077037	0.0043399	0.0025812
	Vehicle parts	0.0291625	0.0293917	0.0177283	0.0109579	0.0081942
RIN	Auto-manufacturing	0.3606092	0.4207747	0.4417124	0.5803921	0.582734
	Auto-assembling	0.5765195	0.4207262	0.4367979	0.4211837	0.3146838
	Motor-manufacturing	0.6294588	0.5110032	0.3691246	0.5434328	0.5318273
	Vehicle engine	0.8203023	0.6749895	0.6897452	0.6387712	0.9461698
	Vehicle parts	0.7167057	0.70505	0.6000557	0.6247178	0.6391674
TO	Auto-manufacturing	1.34	1.42	1.18	1.11	1.33
	Auto-assembling	1.15	1.15	1.11	1.21	1.27
	Motor-manufacturing	2.3	1.77	1.64	1.18	1.39
	Vehicle engine	1.13	0.98	0.88	0.73	0.84
	Vehicle parts	1.17	1.01	1.08	1.02	1.06

Source: *China Automotive Industry Yearbook* (1996-2000), computed by the author

The single-equation model used here indicates a one way relationship from FDI to industrial productivity. However, if local productivity is high the effect may be bidirectional with competitive sub-sections actually attracting inward investment. Generally, China's main attractions for foreign investors include its abundant, cheap, but reasonably educated labour resources, its potentially enormous and rapidly growing market, the preferential taxation and policies for foreign invested enterprises, and its rich reserves of natural resources.

Therefore, FDI in China's automotive industry is market and natural resource seeking FDI rather than efficiency seeking FDI. MNCs are more interested in taking advantage of the cheaper production materials such as labour and land, and gaining access to potentially substantial Chinese domestic markets rather than access to the local technology or productivity. In fact, China's automotive industry, as mentioned above, is still at developing stage and local technology and productivity are not high enough to be attractive for foreign investors (Kokko, et al., 1996).

In order to measure directly the impact of the explanatory variables on the dependent variables in terms of elasticity, as discussed in Chapter 4, the variables in the above equation can be rewritten in logarithmic form:

$$LLP_{it} = \beta_1 LCI_{it} + \beta_2 LFS_{it} + \beta_3 LLQ_{it} + \beta_4 LRFI_{it} + \beta_5 LRIN_{it} + \beta_6 LTO_{it} + \nu_{it} \quad (7.2)$$

where L indicates logged values; i and t denote the sub-sectors of the industry and time, respectively; ν_{it} is a composite term including both intercept and the stochastic error term. The coefficients β_1, β_2, β_3, β_4, β_5, β_6 indicate the percent change in LP

associated with a given percent change in CI, FS, LQ, RFI, RIN, and TO, respectively.

To estimate the equation (7.2), two statistical models POLS and FES are employed. The third model RES can not be used because, China's automotive industry is divided into five sub-sectors and the number of parameters exceeded the number of cross-sections. Also the LR test is applied to identify the better statistical model between the POLS and FES models.

7.5 Empirical Results

The empirical results obtained from the POLS and FES models are summarised in Column (1) and (2) of Table 7.4. In order to take account of the dynamic process of FDI influence, and also because the effects of FDI on productivity may not be felt immediately, a year lagged RFI is included the estimation equation instead of current RFI. The results are presented in Column (3) and (4).

The LR test is performed to compare the two statistical models. The large values of LR argue in favour of the FES models against the POLS models. The estimation results from the two models will be discussed for comparing analysis.

Table 7.4 Results of panel data estimations, 1995-1999

	POLS (1)	FES (2)	POLS (3)	FES (4)
LCI	0.6466	0.1273	0.8722	0.6180
	(0.1448) ***	(0.2496)	(0.2055) ***	(0.2685) **
LFS	0.0890	0.9344	0.0287	0.8768
	(0.0526)	(0.4481) *	(0.0593)	(0.4700) *
LLQ	0.0311	0.1911	-0.5505	-0.9274
	(0.5080)	(0.6573)	(0.6611)	(0.5581)
LRFI	0.0057	0.0111		
	(0.0421)	(0.0681)		
$LRFI_{(-1)}$			0.0185	0.1127
			(0.0494)	(0.0545) *
LRIN	0.3266	-0.0772	0.3604	-0.3476
	(0.1601) *	(0.2006)	(0.2417)	(0.2086)
LTO	1.3692	1.1688	1.3763	0.9595
	(0.2333) ***	(0.3132) ***	(0.3453) ***	(0.2866) ***
C	8.4022	1.2941	7.2500	-1.4040
	(1.4364) ***	(4.8639)	(1.7918) ***	(4.4784)
$\overline{R}^2$	0.8913	0.9354	0.8933	0.9667
NT	25	25	20	20
Test	LR = 8.30*		LR = 17.20***	

Notes: 1. Standard errors are in parentheses.
2. ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% levels, respectively.

As can be seen in Column (1) of Table 7.4, in the results from the POLS model, all of the explanatory variables have the expected signs. The variables of capital intensity (LCI), innovation (LRIN), and turnover (LTO) are statistically significant at different levels, while the variables of firm size (LFS), labour quality (LLQ), and current foreign investment (LRFI) are insignificant.

In Column (2), the results from the FES model show that all of the explanatory variables have the right signs except the variable of LRIN, which is negative but insignificant. LCI is not significant any longer while LFS is significant at the 10%

level. LTO is still significant at a high level. LRFI is still positive but insignificant, which may indicate that current foreign investment does not affect current labour productivity (LLP) immediately. The high and significant coefficients for LFS and LTO reveal that firm size and turnover are the most important variables affecting the labour productivity of China's automotive industry. A 1% increase in LFS and LTO will raise LLP by 0.93% and 1.17%, respectively.

As mentioned above, a year lagged LRFI instead of current LRFI is included in the estimation equation with results from the POLS model shown in Column (3). All of the explanatory variables have the correct signs except the variable LLQ, which is negative but insignificant. LCI and LTO are statistically significant at the 1% level, while the other variables are insignificant including $LRFI_{(-1)}$.

Comparing Column (2) and (4), the larger value adjusted R^2 of Column (4) than Column (2) indicates that the explanatory variables including $LRFI_{(-1)}$ in the estimation equation can explain better the variation in the dependent variable than including LRFI in the equation. Therefore, we will particularly focus on the results presented in Column (4).

In Column (4), the results from the FES model, LCI, LFS, $LRFI_{(-1)}$, and LTO are positive as expected and statistically significant at different levels, while LLQ and LRIN are negative but insignificant.

LCI is positive and statistically significant at 5% level. This indicates that capital intensity positively affects labour productivity in China's automotive industry, which

is consistent with established theory. The magnitude of LCI reveals that a 1% increase in capital intensity will raise labour productivity by 0.62%.

LFS is positive and statistically significant at the 10% level. This result implies that firm size does affect productivity positively, which supports the theory of scale economies. The magnitude of LFS indicates that a 1% firm size increase would result in a 0.88% increase in labour productivity.

$LRFI_{(-1)}$ again is positive and statistically significant at the 10% level, which suggests that a year lagged FDI positively affect labour productivity in China's automotive industry. The magnitude of $LRFI_{(-1)}$ however is not high; a 1% increase in $LRFI_{(-1)}$ will only raise labour productivity by 0.11%.

LTO is also positive and statistical significant at the 1% level; a 1% increase in the turnover times of working capital leads to 0.96% increase in productivity. This result is consistent with that expected.

However, LLQ and LRIN are shown to be surprisingly negative but insignificant with respect to affecting labour productivity. This is difficult to explain. The results may imply that labour quality and innovation are not the important factors associated with labour productivity of China's automotive industry. Another possible reason is the decreasing trend (see Table 3) in the number of technical staff during the five years in the five sub-sectors except the vehicle-parts sector. As for the innovation variable, the time period in this study includes just five years, which may be not long enough to represent the performance from innovation. We can also find theoretical

explanations from Teece's study (1986), which focus on why innovating firms often fail to obtain significant economic returns from an innovation. From a practical point of view, as mentioned above, there is a severe over-capacity of production in China's automotive industry. More innovation investment without industrial restructuring may cause further over-capacity in production, which in turn decreases industrial productivity.

To summarise, the significant determinants of labour productivity in China's automotive industry are capital intensity, firm size, a year lagged foreign investment, and turnover. Higher capital intensity, larger firm size, more foreign investment, and increased-turnover speed would lead to a higher labour productivity. Labour quality and innovation seem not to affect labour productivity in China's automotive industry during 1995-1999.

7.6 Conclusions and Policy Implications

This chapter focused on the impact of FDI inflows on China's automotive industrial productivity by using a small panel data set. China's automotive industry is divided into five sub-sectors according to the *China Automotive Industry Yearbook.* The time series considered is five years from 1995 to 1999. The effects of FDI investigated include both direct and indirect effects on the whole of China's automotive industry at sub-industry level.

The empirical results indicate that capital intensity, firm size, and turnover are the main factors enhancing labour productivity in China's automotive industry. Higher capital intensity, larger firm size, and increased turnover speed lead to higher labour productivity. Meanwhile, foreign investment play a positive role in improving labour productivity, which is consistent with the theory of FDI transferring not only capital but also advanced technologies and managerial skills. The effects of FDI, however, do not materialise in the current investment year. Labour quality and innovation did not appear to affect the labour productivity of China's automotive industry during 1995-1999.

Focusing on the effect of FDI on the labour productivity of China's automotive industry, the Chinese government should further attract FDI inflows into the industry to further enhance labour productivity. As mentioned earlier, China's entry into the WTO forces China's automotive industry to face fierce international competition and tremendous pressure. China's automotive industry should foster auto parts and components manufacturing, achieve a relatively high localisation of domestic content, accelerating the restructuring of the industry. By doing so, auto-industry productivity will be improved, eventually enhancing the competitiveness of China's automotive industry in world markets.

It is necessary to consider briefly the shortcomings of this study. First, the research on intra-industry effects of FDI is restricted and inter-industry influences should also be taken into account. Second, the use of industry data has a number of limitations. It is difficult to distinguish between direct effects, which include the composition effect of higher foreign productivity and the indirect effect, which is

spillovers to indigenous firms. Also it is difficult to control for firm scale effects and general firm heterogeneity (Girma, et al., 1999). We must be cautious to point out that we only estimate the effect of FDI on the productivity of the whole of China's automotive industry including MNCs because the data by different types of ownership are not available. Third, the small panel data size may also affect the reliability of the estimation results.

CHAPTER 8

CONCLUSIONS

8.1 Introduction

This thesis investigated the impact of FDI on China's competitiveness, by focusing on China's economic growth, export performance, and industrial productivity from both macroeconomic and microeconomic dimensions. The main purpose of this study was to provide systematic and rigorous research on whether and how FDI inflows affect China's competitiveness. Empirical evidence is provided on the question of sustained competitiveness in China, which is the largest developing and transition economy in the world.

Chapter 1 provides a very brief preview of this thesis as to why such a topic is selected, what research questions will be detected, the study's background and the structure of the thesis. Chapter 2 presents the theoretical framework and reviews the relevant literature. Chapter 3 introduces the background of FDI in China. Chapter 4 investigates the regional location determinant. Chapter 5 examines the impact of FDI on China's economic growth performance. Chapter 6 discusses the impact of FDI on China's export performance. Chapter 7 assesses the impact of FDI on the productivity of China's automotive industry. Finally, this concluding chapter summarises the main findings of the study, discusses policy implications, and suggests future research topics.

The rest of this chapter is organised as follows. Section 8.2 provides an overall summary of the empirical results from the studies. Section 8.3 discussed the policy implications. Section 8.4 discusses the contributions and limitations of this study and the last section suggests the study topics for future research.

8.2 Overall Summary

This thesis represents an attempt to analyse the impact of FDI inflows on China's competitiveness from both macroeconomic and microeconomic perspectives in terms of economic growth, export performance, and productivity. By using several panel data sets at provincial and industrial level, this study has investigated the impact of FDI inflows on China's remarkable economic growth, export performance, and automotive industrial productivity, respectively.

The empirical analysis of this thesis begins with an examination of the regional location determinants of FDI in China at both national and regional levels. Chapter 4 explains the causes leading to the phenomenon of the skewed spatial pattern of FDI in China. This chapter provides the precondition for the further empirical research of the thesis.

The results in the chapter indicate that previous inflows of FDI, the size of the markets, the preferential policies, and the geographical proximity location variables exercise important positive influences upon current inflows of FDI in China at both of national and regional levels. The agglomeration effect is significantly and positively

connected with FDI inflows at national level but is not significant at regional level. Education appears to be positive and significant in the central region, while it is positive but not significant in the total country, the coastal and western regions. The labour cost variable is negative and insignificant at both national and regional levels but positive in the western region. The infrastructure variables do not appear to be significant in any case, also have the mixed signs across the different levels and regions. The Tiananmen incident has the expected negative sign and significant in all regions of China.

The empirical results also reveal the reasons causing the skewed spatial pattern of FDI in China. The coastal region has attracted 88% of total actually used FDI in China because of the preferential policies, superiority in industrial and economic development, and the historical and geographical proximity to Hong Kong, Macao, and Taiwan.

The results in Chapter 5 show that FDI is one of the most important factors driving China's remarkable economic growth at both national and regional levels. Meanwhile, the labour force is another important engine for the rapid national and regional growth, which reveals that China's economy is still at the stage in which GDP growth mainly relies on the labour-intensive industries. At the same time, human capital is also an important factor affecting economic growth at the national level. However, the role of human capital differs at the regional level among the three macro-regions. It is the most important in the coastal region but not in the central or western regions. Domestic investment does not seem to be statistically significant. The empirical evidence also supports the view that exports did not contribute to

China's economic growth at either national or regional level except in the western region (see Section 5.5 and 5.6 of Chapter 5).

The most important finding in Chapter 6 is that inflows of FDI improve the competitiveness of total firms' exports in China especially in the central region. However, FDI has less influence on the export performance of indigenous firms. We also find domestic investment, labour, and human capital are the important factors for driving export performance in the three macro-regions of China which implied that the main export products from China are labour-intensive and capital-intensive products. The real effective exchange rate is important in affecting the export performance of total firms in China.

In Chapter 7, the empirical results indicate that capital intensity, firm size, and turnover are the main factors which enhance labour productivity in China's automotive industry. Higher capital intensity, larger firm size, and higher speed turnover would lead to a higher labour productivity. Meanwhile, foreign investments play a positive role in improving labour productivity, which is consistent with the theory of FDI transferring not only capital but also advanced technologies, managerial skills, although the effects of FDI do not materialise in the current investment year. However, labour quality and innovation appear not to affect the labour productivity of China's automotive industry during 1995-1999.

8.3 Policy Implications

Government policies that attract and control FDI have become the focus of considerable attention in developing countries in recent years. Whether and how FDI influences the host country's competitiveness depends on the role and direction of host government intervention. Dunning (1988, p.57) pointed out:

"Where, however, the wrong economic signals are given by host governments, and MNCs operate within a monopolistic or oligopolistic environment with their goals geared more towards protecting market shares rather than to profit maximisation, then technology imports may both lower X-efficiency and lead to a sub-optimum allocation of resources between firms or sectors. Moreover, even if X-efficiency were raised, if the whole of the gains are recouped by the foreign firms, then the host country is not better off."

Therefore, the host country's government plays an important, even crucial, role in determining the effects of FDI on the host country. In other words, the contributions of FDI, to a large extent, depend on the ability and willingness of the host government to pursue the 'right' policies.

Many examples of the potential impacts of governmental policies can be cited. The regulatory structure enacted by a host government may have a large impact on the activities assigned to a foreign subsidiary. Host country's environmental regulations may induce the MNC to provide its subsidiary in that country with either a less substantial production role or more advanced technologies to meet the host

government's restrictions. Local ownership requirements may influence the size and types of subsidiaries located in particular countries.

To the Chinese government, an important element in the overall framework for enhancing competitiveness is further support to attract FDI inflows. China is the largest developing and transition country and needs specific policy measures to support structural changes and the growth in competitiveness. The Chinese government should keep its foreign investment policy coherent and stable, and further optimise the investment environment.

China is currently undergoing an industrial restructuring. The development of high-tech industries and the revitalisation of existing industries are vital to continued economic growth. The government should endeavour to optimise foreign investment structure while upgrading investment quality. The linkages between foreign and domestic sectors should be improved. By doing so, FDI in China will focus more on technological upgrading, take a more active part in restructuring state-owned enterprises, which in turn will sever China's economic restructuring, and eventually enhance China's competitiveness. Also the government should encourage foreign investors to invest in the central and western regions to help China's western development strategy.

China's accession to the WTO has also further enhanced its capacity to attract foreign investors. In addition, several factors have made China a place of first choice for multinational investors from the world, including its populous market, continued

economic growth, stable political situation, sound investment environment, and successful bid for the Olympics (People's Daily Online, 9th Sep 2002).

On the one hand, FDI is crucial to the development of the economy, exports,. employment opportunities, and competitiveness in the host countries. On the other hand, it generates potential opportunities for investors to gain initiative or to get a competitive edge within the framework of international competition. The policies of effective and more efficient use of FDI facilitate the development of both FDI and the host country's economy.

For strengthening China's competitiveness in the world, the Chinese government should also stress the equal importance of the "Draw more foreign investment" and "Go global" policies. Not only in order to attract more FDI inflows into China, but also to encourage Chinese enterprises' investment abroad and to take an active part in international competition and cooperation.

8.4 Contributions and Limitations

The contributions of this study are built around an assessment of the most accessible multi-dimensional studies of competitiveness. The main features and contributions of this thesis to the literature are summarised below:

First, this thesis introduces the topic of the impact of FDI on China's competitiveness, to fill a gap in the existing literature by a systematic study. Second, this thesis conducts a panel data approach for the four empirical investigations by using several of the most recent panel data sets and different methodologies, which would make statistical estimations more robust. Third, China is divided into three macro-regions and the empirical analysis is conducted at both national and regional levels. Fourth, this study makes a significant contribution to knowledge by modelling the impact of FDI on export performance at two levels: total firms and indigenous firms. As a result, we are able to see the spillovers from FDI, whether and how FDI presence affects indigenous firms' export performance. Fifth, this study investigates the impact of FDI on the productivity of China's automotive industry, to which attention has not been given in the existing literature. Finally, importantly, this study is not only significant to China but also to other developing and transition economies who aim to adjust their policy regimes on FDI to enhance their national competitiveness.

However, this study fails to cover some aspects regarding the effects of FDI on China's competitiveness, such as the impact of FDI inflows on China's employment

and R&D owing to the limitation of data availability and research duration. These should be research topics for further study.

In addition, there are limitations in this thesis. First, since FDI constitutes a major component of the national economy of a given country, policy actions inevitably affect decisions of foreign investors in an economy. However, due to the availability of data, the analysis could not examine the effects of policy regimes on ownership preference in China. Second, generalisation of the findings is limited. Since the analysis in Chapter 7 covers only China's automotive industry, the results reported may not be applicable to other industries. Third, as mentioned in Chapter 7, it is difficult to measure the spillover effects from FDI on productivity of indigenous firms by using industrial data.

8.5 Future Research

As mentioned in the last section, this thesis fails to investigate some aspects such as the impact of FDI inflows on China's employment and indigenous firms' R&D and innovation activity owing to the limitation of data availability and research duration. The future research should be conducted from these two perspectives.

Employment is thought to be an important aspect of national competitiveness. For many developing countries, especially for those countries having a large number of unemployed populations, the creation of employment is one of the top priorities of economic policy.

In his study, Lall (1995) analyses that the effects of FDI on employment in the host country can be split into two aspects: direct and indirect effects. Direct effects can be further divided into initial and subsequent effects. The initial effects depend on a number of factors such as the size and mode of entry, the nature of the technique chosen, and the location of investment. The subsequent direct effects depend on the strategies of MNCs regarding the level and speed of technology upgrading, trade orientation, the place of the affiliate in the global production and trade strategies of the parent company, and the levels and types of skills needed for the operation of the affiliate. Also economic and market conditions in the host countries influence the subsequent direct employment effects of FDI.

In addition to increasing employment directly, FDI can have indirect effects in a number of ways. Indigenous firms competing with the MNCs can experience both positive and negative effects. On the positive side, the entry of foreign competition can force indigenous firms to become more efficient and may provide spillovers in skills, management techniques or technical knowledge. On the negative side, such entry can force indigenous firms out of business through competition. The net indirect effect of FDI on employment will therefore depend on the competitive capability of indigenous firms. If indigenous firms are capable, then the entry of MNCs can stimulate greater productivity and exports, creating new and better employment opportunities with competing firms. If indigenous firms are deficient, however, job losses can result.

UNCTAD (1994) pointed out that estimates for a number of developing countries suggest that at least one-to-two jobs is generated indirectly for each worker employed

by foreign affiliates. China is a typical developing country with the largest population size in the world. Employment creation has been a primary policy goal of the Chinese government. This is critically important for political stability as well as economic welfare, which in turn enhances competitiveness. Further research can be carried out on whether and how FDI inflows affect China's employment.

R&D and innovation are the important key factors in maintaining and enhancing national competitiveness because they are potentially important driving forces for long-term productivity and economic growth and export performance as well. In fact, competitive advantage is sustainable only to the extent that it cannot be initiated by competitors. However, most sources of competitive advantage can be imitated or substituted. As competitors learn to substitute or copy the existing knowledge, new knowledge can be created through R&D and innovation, which enables a nation to maintain its competitiveness by remaining ahead of the competition (O'Donnell and Blumentritt, 1999).

In his diamond model of national competitiveness, Porter (1998) stresses the role of innovation in a nation's competitive advantage. He argues that such innovative capability stems from four determinants of national competitive advantage, which are the four points of the diamond model: factor conditions; demand conditions; related and supporting industries; and firm strategy, structure, and rivalry. Each of these determinants influences the competitive ability of firms within a nation, by which to explain why firms from one nation outperform firms from other nations in a particular industry. One of the key arguments is that each of the four points of the diamond can stimulate the innovation process that occurs within organisations.

Increasing FDI inflows are likely to enhance competition in the domestic market and reduce the indigenous firms' profitability (Bertschek, 1995). As a result, indigenous firms have to produce more efficiently. Increasing R&D and innovation activity is one possible way for indigenous firms to react to enhanced competition in order to remain competitive. On the one hand, FDI therefore reinforces the threat to indigenous firms' market position and may have a more permanent effect on their innovative activity. On the other hand, indigenous firms can also derive profits from the presence of MNCs in the domestic market via spillover effects since MNCs generally have competitive advantages in R&D.

Walz (1997) investigates the effects of FDI as a specific asset in a dynamic general equilibrium model with endogenous technological change. He found that FDI enables the developing economy to learn from the production activities of inward MNCs. R&D efficiency in the country is thereby increased and innovation becomes profitable. Bertschek (1995) analyses the hypotheses that imports and inward FDI have positive effects on the innovation activity of domestic firms by using a panel data set containing 1270 firms of the German manufacturing industry from 1984 to 1988. The empirical results reveal that both import share and FDI-share have positive and significant effects on product and process innovations. By contrast, the econometric estimations in the study of Veugelers and Vanden Houte (1990) show a negative effect regarding the presence of MNCs on the R&D activities of 47 Belgian indigenous firms over the three years by using a game theoretical approach.

Following the research of Mowery and Oxley (1995), it is now widely accepted that indigenous firms that conduct their own R&D and innovation are better able to

assimilate and adopt the advanced foreign technologies and to capture more of the spillover benefits created by MNCs. The more advanced or complex a foreign technology is, the greater the need for developing indigenous technological capacity to facilitate its exploitation. To some extent, indigenous R&D capabilities enable a developing country to effectively join into the international flows of latest technologies (Dowling and Ray, 2000). The ability to adopt new technologies and organisation forms is increasingly important as a source of comparative advantage (Lall, 1995). Therefore, it is essential and interesting to investigate whether and how FDI inflows affect the R&D and innovation activities of China's industry and indigenous firms.

APPENDIX

The List of Variable Abbreviations

FDI is foreign direct investment and is measured by the actually used FDI

GDP is gross domestic product and is a proxy for market size

WAG is the average annual wage of staff and workers and is a proxy for labour cost

RRW is the ratio of the length of railways in operation to the land area and is a proxy for infrastructure

RHW is the ratio of the length of highways to the land area and is a proxy for infrastructure

RED is the ratio of education to population and is a proxy for human capital

AGG is agglomeration and is measured by the ratio of employment to land area

DTM is a time dummy variable and is a proxy for the Tianamen Incident influence

DLP is a dummy variable and is a proxy for geographical location and preferential policy influence

GGDP is the growth rate of GDP and is a proxy for economic growth

LA is labour and is measured by the number of staff and workers

GLA is the growth rate of labour

DI is domestic investment and is measured by total investment in fixed assets

RDI is the ratio of domestic investment to GDP

RFDI is the ratio of FDI to GDP

HC is human capital and is measured by the number of students enrolled in specialised secondary school

GHC is the growth rate of human capital

TEX is total firms' exports including foreign-funded firms' exports

IEX is indigenous firms' exports

REER is the real effective exchange rate index

LP is labour productivity and is measured by the ratio of value-added of the industry to the annual average number of staff and workers

CI is capital intensity and is measured by the ratio of net value of fixed assets to the annual average number of staff and workers

FS is firm size and is measured by the ratio of gross industrial output value to the number of firms

LQ is labour quality and is measured by the ratio of the number of technical staff to the annual average number of staff and workers

RFI is the ratio of foreign investment to total capital

RIN is the ratio of innovation investment to total investment

TO is turnover of working capital and is measured by annual turnover times of working capital.

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